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MAR 76 T H ALLEN, R B RINGO N00014-75-C-0708

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March 1976

MATERIEL WEIGHT AND CUBE CONTROL (1975-1980)

By: T. H. ALLEN, JR., and R. B. RINGO

Prepared for:

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U.S. MARINE CORPS
WASHINGTON, D.C. 20380
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800 QUINCY STREET
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amphibious assault ships to determine lift short falls. The effect on lift requirements of future changes to landing force materiel is analyzed. Described is a computer system designed as a decision aid for systematically reducing landing force materiel when required to load assault forces into a constrained amphibious lift capacity while optimizing the operational readiness of the force. A procedure for analyzing the effect on amphibious lift capability of introducing new materiel into the Fleet Marine Force is presented.

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Procedures are given for reducing USMC landing force materiel to be embarked in USN amphibious assault ships while minimizing loss of force readiness or sustainability. The feasibility of reducing this materiel by incremental phasing of units into the objective area by means other than amphibious assault ships is evaluated. Amphibious lift requirements for Marine air/ground task forces are computed by the SRI/NWRC-developed MAGTF computer system. Lift requirements of the assault echelon of a Marine Amphibious Force are compared with the capacities of available Navy amphibious assault ships in order to determine lift short falls. The effect on lift requirements of future changes to landing force materiel is analyzed. Described is a computer system designed as a decision aid for systematically reducing landing force materiel when required to load assault forces into a constrained amphibious lift capacity while optimizing the operational readiness of the force. Also provided is A procedure for analyzing the effect on amphibious lift capability of introducing new materiel into the Fleet Marine Force is presented.

PREFACE

The objective of logistics support for an amphibious landing has always been to provide the landing force with the materiel and equipment it needs for the duration of a campaign. In the past, those charged with the task of developing the logistic support operations used a simple, straightforward method. A scheme of maneuver would be projected for anticipated combat ashore, and logistic support requirements would be developed from this scheme and from the usage rates of previous similar combat operations. Shipping requirements would than be determined from the computed weight, cube, and square of personnel to be embarked.

Current and future anticipated economic constraints on the Military Services of this country may reduce the number of naval ships dedicated to amphibious warfare below levels previously available. This could result in shortages of lift capacity which will require modifications to earlier procedures for embarking MAGTF's. One aid to the logistics planner to offset this lift constraint will be a system that provides a rapid and accurate estimate of materiel and supplies required to sustain a landing force in accomplishing its combat mission.

Of critical importance to the planner will be the designation of those support functions expected to be required in the amphibious objective area (AOA) before arrival of the assault follow-on echelon shipping. Due to the shortage of naval amphibious ships comprising the assault echelon of the amphibious task force, the planning task includes determining those units whose functions are required to support the combat units of the MAF from D-Day to arrival of the AFOE in order to reduce the materiel required to be embarked in the assault echelon ships. During planning for the

arrival of the AFOE ships (when additional units and the preponderance of materiel became available for employment in the operation) consideration must also be given to the determination of functions, personnel and materiel actually required in the AOA during the assault phase, time-phasing of materiel into the AOA as it is needed and air lift utilization when the situation permits.

Against this background, a series of logistic planning studies have been conducted by the Naval Warfare Research Center of Stanford Research Institute. When implemented, these studies will improve the logistic support planning process with respect to the Fleet Marine Force. The project, "Marine Air Ground Task Force Lift and Logistic Planning Factors Model (1975-1985) (MAGTF)," completed in January 1975, provides data expressing the amphibious lift requirement based on current allowances and replenishment rates. The MAGTF Model generated by that project provides the necessary tool for computing amphibious lift requirements for variable levels of materiel.

Based on data obtained from the MAGTF Lift Model, the landing force materiel of a notional MAF that is desired to be embarked in amphibious shipping has far greater volume than the total capacity of the available amphibious assault ships. Procedures are developed for reducing landing force materiel in a constrained amphibious lift capacity environment so that the operational readiness of the embarked force has been optimized.

The study was conducted for the Commandant of the Marine Corps under Contract N0014-75-C-0708. The originating agency was the Deputy Chief of Staff (Research Development and Studies). The sponsoring agency was the Concepts and Analysis Branch, Deputy Chief of Staff for Installations and Logistics (LPC). Project officer was Lieutenant Colonel J. E. Miller, USMC, Head, Concepts and Analysis Branch.

The analysis was conducted by members of the Tactical Logistics and Mobility Program of the Naval Warfare Research Center (NWRC), L. J. Low, Director. T. H. Allen, Jr., was the project leader. Other SRI principal contributors were C. J. Bording, R. S. Garnero, C. M. Ramos, and R. B. Ringo. A. R. Grant provided data from the GAMUT Simulation Model in support of the amphibious task force unloading problem. W. H. 7wisler assisted in the MAGTF improvement task. Dr. J. L. Brenner served as consultant to the project.

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I INTRODUCTION

The objectives of the study, and thus of this report, are to:

(1) Within the constraints of operational readiness and sustainability, determine the feasibility of reducing amphibious lift requirements by reducing the weight and cube of landing force materiel that is presently in the inventory or programmed; and, if feasible, recommend specific implementation actions.

(2) Determine the feasibility of reducing overall amphibious lift requirements by the redesign of the incremental phasing and scheduling of materiel into the amphibious objective area; and if feasible, recommend specific implementation actions.

(3) Determine actions necessary to establish a viable weight and cube control program for landing force materiel, which will insure that lift requirement considerations are given major attention during the materiel acquisition process.

The foregoing objectives have been achieved without exception.

Section II, immediately following, presents in executive summary form the general findings of the study within the framework of the above-cited objectives. Every attempt has been made to match objectives with results without unnecessary elaboration or detail. Thus, the reader desiring to quickly grasp the essence of this report is obliged to read no further than the summary and Section III, the Conclusions and Recommendations.

Those readers wishing to explore the details of the completed research are invited to pursue the remaining sections of the report. These sections essentially reflect the research steps taken during the course of the study. A brief description of these steps is given here for guidance.

(1) Section IV presents a development of the problem as defined by the first two study objectives.

(2) Section V provides an explanation of the data used to conduct the analysis of the study.

(3) Section VI describes the computerized mathematical models used to obtain the problem solution procedure.

(4) Section VII contains the data analysis and numerical results supporting the problem solution procedure.

(5) Section VIII explains the Materiel Weight and Cube Control Program developed during the study, as required by the third objective.

(6) Section IX presents a description of an automated data systems (ADS) environment for implementing the computer system developed within the study.

(7) The appendices contain technical information, i.e., extensive data supporting the analysis, mathematical model descriptions, and general flow charts describing computer programs.

A. Scope

The primary source of guidance for the research reported on in this document was the Marine Corps Mid-Range Objectives Plan (MMROP). The stated capability requiring the lift of the assault echelon of a MAF by amphibious assault ships provided the basic framework for the scenario within which the principal areas for research were conducted. Subsidiary research into the use of common user airlift and sealift to support the total MAF lift requirement was also included.

The study examined in detail the nature and extent of landing force materiel as defined and computed by the MAGTF Computer System. It should be noted that results obtained from this study are based upon the assumption that the MAGTF Computer System expresses a true representation of amphibious lift requirement for the units depicted as derived from official allowances, with the exception of MAGTF data base deficiencies defined in Section V of this report.

The numbers and characteristics of amphibious assault ships defining amphibious lift capacity to support the assault echelon (AE) of the MAF were also included in the research effort.

The effect of unloading times for amphibious assault ships on the possibilities of phasing units within the AE troop list ashore from assault follow-on echelon support ships was part of the study.

A research task was conducted to develop a materiel weight and cube control program which would monitor the effect on the lift status of units in the FMF from introducing new items of materiel into tables of equipment (T/Es).

A MAGTF Program improvement task was included in the study with the purpose of reducing the excessive processing time required to compute MAF lift requirements using the original version of the program.

B. Method of Approach

The study was conducted in three phases. Phase I included the MAGTF improvement task, which was required to support the study effort. The gathering of pertinent data and specification of the scenario were also part of Phase I.

Phase II was devoted to analyzing landing force materiel in its many categories for accuracy and completeness and developing mathematical models to conduct the necessary data analysis. The extent of the amphibious lift short fall, i.e., landing force materiel of the AE that cannot be loaded into the available amphibious assault shipping was determined.

The data analysis conducted during Phase III provided the insight necessary for generating a computer assisted decision aid that provided the solution procedure for satisfying the objectives of the study.

C. Glossary of Terms Used in the Study Report

In order to assist the reader in understanding the special meanings of the various terms used in this report, the following glossary is provided.

MAGTF--Marine Air Ground Task Force of MAF, MAB, or MAU.

MAU--Marine Amphibious Unit, with the battalion landing team as the combat element.

MAB--Marine Amphibious Brigade, with the regimental landing team as the combat element.

MAF--Marine Amphibious Force, with the reinforced Marine Division providing three regimental landing teams as the combat element.

AE--assault echelon of the MAF.

AFOE--assault follow-on echelon of the MAF.

Amphibious lift requirement--the totals of bulk cargo in units of the measurement ton (40 cubic feet) and square loaded cargo in square feet for a unit or groups of units.

Amphibious lift capacity--the bulk cargo (in measurement tons) and square loaded cargo (in square feet) that can be loaded into an amphibious assault ship or groups of ships.

Amphibious lift short fall--the amount of cargo that could not be put into a group of amphibious assault ships for a specified group of troop units.

Constrained amphibious lift short fall--the amount of cargo that could not be put into a group of amphibious assault ships after having been reduced by an applied constraint for a specified group of troop units.

AOA--amphibious objective area.

SMLS--Seaborne Mobile Logistics System.

Unit load--the amount of cargo carried by a unit when embarked in assault shipping, consists of organic materiel and a specified number of days of supply for mountout.

Landing force supply--the amount of cargo embarked in assault shipping and required to support the AE of the MAF, consists of the specified number of days of supply of mountout.

TFE Model--Transportation Feasibility Estimator Model, converted to a practical computer simulation program from a CINCPAC version called GFE by HQ FMFPAC.

CSS--combat service support, used in this study to designate a group of units recently reorganized.

MAGTF System--refers to a series of computer programs and data base developed by NWRC/SRI in a previous project.

MAGTF Program--the computing program of the MAGTF System providing the lift requirement listings used in this study.

DODIC--Department of Defense identification code for ammunition items.

OMA--a designation for unit cargo to support organizational level maintenance in USMC aircraft squadrons.

IMA--a designation for unit cargo to support intermediate level maintenance in USMC headquarters and maintenance squadrons.

TMR--Tables of Manpower Requirements, an automated file of tables of organization used by the MAGTF System to update the MAGTF data base.

VALU card--the term used to describe the card input used to manually update the MAGTF data base.

CREATE--the computer program within the MAGTF System that converts the tape files of the MAGTF data base to direct access disk files.

FLOAT quantities--an amount of equipment in supply classes IIW and VIIW carried by units of the Force Service Support Group to replace major end items deadlined from FMF units.

LVTs--landing vehicles tracked (amphibious tractors) used by the AE of the MAF to carry initial assault waves to the beach.

JOPS--Joint Operational Planning System (defined in JCS Pub 6, Part 6).

CARF--combat active replacement factor (derived from the TAM).

TAM--Table of Authorized Materiel.

II SUMMARY

A. Feasibility of Reducing Amphibious Lift Requirements

It is possible to examine the impact of reducing the amount of cargo desired to be embarked in amphibious ships of the assault echelon on force effectiveness and/or sustainability through the use of constraints applied by a computer system designed to augment the decision making process.

Research into the feasibility of reducing amphibious lift requirements directed the study efforts to analyzing the purpose, composition, and amount of materiel to be loaded into amphibious assault ships for units comprising the assault echelon (AE) of the MAF. The basic scenario for the study defines the amphibious lift problem within the framework of lifting the AE of the MAF by sea for an assault on a hostile shore. This scenario constitutes the greatest demand for lift as outlined by the MMROP, which was used as the basic guidance for the study.

The first research task performed to determine the feasibility of reducing amphibious lift was to analyze the table of equipment (T/E) for a sample of organizations included in the AE for nonessential equipment. Findings from this task established that units are continuously conducting T/E reviews to eliminate nonessential items. Many items included in T/Es are essential for some function at some specific time but may not be essential for carrying ashore in an amphibious assault and could be landed from AFOE support ships at a later time in the operation. While this task failed to provide a significant reduction in lift requirements, it did suggest an approach for the solution procedure that was later developed.

Comparison of the amphibious lift requirement obtained from the MAGTF System (using the force structure contained in the MMROP) and the total capacity of the available force of 59 amphibious ships showed that only 60 percent of the designated materiel of the AE of the MAF could be loaded. This result varies drastically when compared to the MMROP notional MAF assault echelon requirement which supposedly can be lifted by a force of 49 amphibious ships.

The determination of the magnitude of the amphibious lift short fall directed research efforts to the development of a systematic procedure to reduce unit amphibious lift requirements by the application of constraints until the reduced force could be loaded into the available lift capacity. The system developed permits the evaluation of operational readiness for every constraint level applied and further determines the effect on the lift short fall from varying the mountout days of supply for loading in assault shipping.

The systematic procedure generated to reduce amphibious lift requirements consists of three computerized mathematical models organized into a computer assisted decision aid to be used by the commander and his staff on an on-line-real-time basis or in a batch-mode processing environment. The system named, the Constrained Amphibious Lift Analysis System (CALAS), combines the computational power and speed of the computer with the operational experience and subjective judgment of the Commander to determine the force level which optimizes operational readiness within the constrained amphibious lift environment. The study provides extensive constrained loading analysis using the AE of a notional MAF within the framework of the scenario to demonstrate the practicality and feasibility of the developed approach to the constrained amphibious lift problem.

B. Feasibility of the Incremental Phasing of Materiel Into the Amphibious Objective Area

The incremental phasing of materiel to reduce amphibious lift requirements appears entirely feasible. "Appears" is the appropriate descriptor since, while the second objective of the study directs the study of the feasibility of reducing landing force materiel carried by the AE by incrementally phasing and scheduling materiel into the objective area, the scenario for the study contained only notional forces without a specified enemy or terrain, and the requirement to include units performing specialized functions in the AE could not be specified. The analysis therefore was limited to determining the effects on the constrained lift problem of removing these units from the AE troop list.

The solution procedure, CALAS, was also used to determine the effect on the amphibious lift short fall from varying the units within the AE force structure to obtain a problem solution. In point of fact, no solution is possible without the combination of varying the units to be included in the troop list with the systematic reduction of materiel from included units and the possible reduction of mountout to be carried by the AE. Both eliminated units and materiel from embarked units are assumed to be phased ashore from the AFOE support ships.

The effect of the timing problem on phasing AE units ashore from the AFOE support ships was determined by calculating unloading times from a computer simulation model called GAMUT. This task showed that all ships of the 59-ship force lifting the AE could be unloaded in 37 hours. The days required would depend on the hours per day unloading could take place. A beach cargo handling simulation was also used to determine that adequate materiel handling assets were available to prevent beach congestion.

C. Implementation Considerations for the Constrained Amphibious Lift Analysis System

The study presents a concept which adapts the computer programs of CALAS into the management information systems (MIS) of the future. The exact configuration of Marine Corps Automated Data Systems (ADS) of the 1980s is presently under study at SRI. The Marine Tactical Command and Control System is also presently under development. CALAS would become an operational system to be employed in a predeployment environment and could reside in either an administrative, tactical or combination MIS.

Although the development of computer software for installation on a USMC computer system was not envisioned at the beginning of the study, the obvious advantages of using a system such as CALAS to be a computer assisted decision aid for field use will require careful consideration. The primary application for this system would be at the MAF staff level. The proposed system would be accessed by the MAF G-4 from a terminal in his office on line with the MAF computer. Within a period of about 5 hours or less, depending on the number of units in the MAGTF troop list prepared in response to a warning order, the MAF G-4 would be able to analyze and solve a constrained amphibious lift problem presented by an insufficient number of amphibious assault ships achieving an optimized operationally ready force.

D. Actions to Establish a Materiel Weight and Cube Control Program

The third objective of the study required the development of Materiel Weight and Cube Control Program. In effect, this objective defined a research task which would develop a procedure to be included within the Marine Corps materiel acquisition process to determine the effect on amphibious lift of introducing new items of equipment into the T/Es of FMF units. The MAGTF System was found to be ideally suited for this purpose.

During the acquisition process a time is reached when the physical characteristics of an item are established on a conceptual basis. Since most items are replacing some existing piece of equipment, the procedure advanced in this study consists of performing an update of the MAGTF data base to include the newly considered item of equipment. Once this is done, MAGTF runs would be processed for units planned to receive the new equipment. Lift totals of these units would be compared before and after the introduction of the new equipment to determine the overall effect on lift.

The principal advantages of this procedure are that the MAGTF program includes not only the weight, cube and square of the item, but also computes the secondary effect of fuel requirements, repair parts, and ammunition requirements if appropriate. The update of the MAGTF data base requires the inclusion of these secondary lift requirements when appropriate.

The study offered an example of how this procedure should be accomplished and computational results. The new family of shelters was used as a prime example. With the increase of 13,900 square feet of shelter space, an increase of 62.5 measurement tons of bulk cargo requirement and 2500 square feet of square loaded cargo space on the AE of the CSS MAF would occur upon the introduction of the shelter items.

III CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The conclusions derived from the analysis reported herein have been organized to support each objective of the study in order of their importance. Conclusions are also presented at the end of each section. Following each conclusion is a page number reference which includes the section and the page.

1. Objective I

(a) The cargo lift requirement for the assault echelon of a representative MAF, as presented in the MMROP, is significantly less than that computed by the MAGTF System. (Page

(b) Based on the MAGTF System Data, an amphibious lift short fall of approximately 40 percent would occur when loading the assault echelon of a notional MAF into the available amphibious assault ships used in this study. (Page IV-14.)

(c) Based on the MAGTF System Data, significant amphibious lift short falls will exist when attempting to load a MAB whose troop list is the size of the notional MAB used in this study into a 34-ship force, and, to a greater extent, a 21-ship force. (Page VII-56.)

(d) The use of CALAS installed within an automated command and control system provides the computational support necessary to systematically determine the optimal operationally ready force in a constrained amphibious lift environment in a short period of time during the planning phase of an amphibious operation. (Page VII-2.)

(e) The Constrained T/E Embarkation Analysis Model using the criticality factors denoting all item's importance to a unit's function provides a practical systematic methodology for reducing a unit's T/E when its lift requirements

must be constrained by limited assault shipping assets. This analytical procedure may also be used to compute lift requirements for airlift when a percentage reduction of unit T/E materiel is desired. (Page VII- 7.)

(f) It is feasible to implement CALAS on USMC computer systems to function as a computer assisted decision aid in amphibious staff planning. (Page IX- 6 .)

(g) Current USMC computer installation work loads will dictate the timing of installing CALAS on USMC computer systems. (Page IX-6.)

(h) The overall capability of the MAGTF System and the continuous requirement for lift data from all categories of cargo available from this system justifies the expenditure of effort to conduct the further improvement of the MAGTF Program and continued updating of the MAGTF data base. (Page V-15.)

(i) The MAGTF System generated lift expression for the MAF is the most current and accurate source of this specialized data in existence. (Page V- 2 .)

(j) The known errors in the MAGTF System data cause an understatement of the total lift requirement. (Page V- 9 .)

(k) The T/E reviews conducted by units in the FMF prevent the accumulation of significant quantities of non-essential equipment. (Page V-16.)

(l) The combat active replacement factor (CARF) used to compute PWRM for mountout and mountout augmentation is not currently based on realistic expected consumption rates for supply classes IIW and VIIW. (Page V-30.)

(m) The statement of mountout for supply classes IIW and VIIW computed from current combat active replacement factors (CARF) may be inadequate to support future expected combat losses. (Page V-30.)

(n) The practice of using the same value for CARF for mountout calculations regardless of the different missions of units in the force results in an inadequate statement of mountout or prepositioned war reserve materiel. (Page VII-51.)

2. Objective II

(a) The lift requirements for the notional MAF AE are larger than can be satisfactorily reduced by applying constraints to complete units in order to fit into amphibious assault shipping capacity. The solution procedure advanced in this study requires the incremental phasing of certain AE units into the objective area from AFOE support ships. (Page VII-28.)

(b) An assessment of the time phased deployment ashore possibilities for combat and combat service support units within the MAGTF mission provides the greatest potential for optimizing the utilization of limited amphibious assault ship assets. (Page VII-29.)

(c) Based on GAMUT simulation results, the potential for landing the AE from the amphibious assault force used in this study within 3 days is a real possibility. (Page VII-46.)

(d) In some amphibious operations, units may begin unloading from AFOE support ships from D+2 on. (Page VII-46.)

(e) The unloading rates simulated by GAMUT can be supported by the units handling cargo transfer operations at the beach. (Page VII-47.)

(f) Sufficient ships are available to lift the AFOE of the MAF from common user sealift assets. (Page VII-69.)

3. Objective III

(a) The comparative analysis between the existing/replacement shelter systems performed with the assistance of Program MAGTF to determine the effects upon amphibious shipping requirements has demonstrated the usefulness of the program in a cube, square, and weight control program. (Page VIII-9.)

(b) The "conceptual stage" of system and materiel acquisition by the Marine Corps could utilize Program MAGTF to determine the total effects of the new acquisition on the lift requirements of the MAF. (Page VIII-2.)

(c) The utility of Program MAGTF may also be used in the "conceptual phase" of system and materiel acquisition to investigate the secondary effects of the acquisition, such as fuel consumption, repair parts requirements, ammunition consumption, and personnel requirements. (Page VIII-3.)

B. Recommendations

1. The following recommendations are provided to satisfy objectives 1 and 2[1].

(a) The amphibious lift expression computed from the MAGTF System should be by cognizant Marine Corps considered for adoption staff agencies for official planning data.

(b) The MAGTF lift expression should be considered for use by Fleet Marine Force Commands to determine materiel deficiencies relative to authorized allowances.

(c) The Constrained Amphibious Lift Analysis System should be considered for adoption as a planning aid in Fleet Marine Force Commands. If recommendation (c) is approved, NWRC/SRI would be available to prepare an IBM 360 computer system version of CALAS and to install on a MAF computer of the 360-65 configuration.

(d) The proposal submitted to Headquarters U.S. Marine Corps to conduct the improvement task for the MAGTF program should be considered for use at an appropriate time and be considered part of the implementation of CALAS on MAF computer systems.

(e) The proposal mentioned in the previous recommendation includes a task for correcting MAGTF data base deficiencies and to support a continuous data base update effort. It is also recommended that this task be given favorable consideration.

(f) A study to conduct a detailed analysis of the combat active replacement factors used to compute mountout for supply classes IIW and VIIW and usage rates for supply class IX be considered for the studies program in the near future. This study should also analyze the requirement to assign CARFs to units reflecting the mission in the assigned values.

[1] See Page I-1 for the study objectives.

2. The following recommendations are provided to satisfy objective 3[1].

(a) That the Materiel Weight and Cube Control Program defined in this study be considered for adoption within the Marine Corps Materiel Acquisition Process.

(b) The utility of Program MAGTF should also be considered for use in the "conceptual phase" of system and materiel acquisition to investigate the secondary effects of the acquisition process to include fuel consumption, repair parts requirements, ammunition consumption, and personnel requirements.

[1] See Page I-1 for the study objectives.

IV STATUS OF AMPHIBIOUS LIFT

A. General

In the amphibious planning cycle, the stated mission, scheme of maneuver, and geographic characteristics dictate the troop list and days of supply from which amphibious lift requirements are derived. At this point in the cycle, the number of amphibious assault ships required can be determined, permitting the comparison of lift capacity with lift requirement. The predominant consideration in the current amphibious planning environment is the shortage of amphibious assault ships needed to conduct training exercises, support the forward deployment of the MAU and MAB, and lift the assault echelon of the MAF when supporting contingency plans.

When considering the problem of the amphibious ship short fall, one can move in the direction of obtaining more ships, if feasible, or one can examine the nature of landing force materiel planned for embarkation to discover, if possible, where reasonable reductions may be effected. In other words, is the materiel to be embarked in excess of that required to accomplish the assigned mission? To answer this question, there are four principal areas to pursue. The first area is the requirement to justify each unit included in the troop list with respect to the landing force mission. The second area is the combat environment, which includes the enemy situation and terrain. In this regard, certain units may not be required in the objective area until some period after D-Day, thus affecting the selection of units embarked in assault shipping. The third area is the requirement to include all Table of Equipment (T/E) materiel belonging to each unit in its loading plan. The fourth area is the

specification of the days of supply (DOS) embarked with the landing force. When amphibious lift capacity is fixed at some level below the desired lift requirement, reductions must be exacted from the four areas stated above. Since a specific mission and combat environment was not given for the study, an analysis of troop list adequacy to support a mission is not included. However, tradeoffs in lift requirements from removing certain units from the troop list are offered; these may be used for planning until an actual mission is assigned to a landing force commander. These four areas affecting landing force materiel constituted the major research areas of the study. Research into these areas provided the support for satisfying the first two objectives of the project.

This section contains the factors defining the scenario that provides the structure for analyzing landing force materiel within a constrained amphibious lift environment. The amphibious lift short fall will be presented, along with the lift capacity derived from the list of amphibious ships and their characteristics affecting loading that were used in the study. The lift requirement for the MAF troop list obtained from the MMROP, as modified by the MAGTF Project and the MAF troop list containing the new combat service support (CSS) organizations, are used to determine the amphibious lift short fall.

B. Scenario

The structure for conducting this study was directed to be employment of a notional MAF as described in the MMROP. The case taken for the primary research was the deployment of a MAF to an overseas destination totally by sealift, excluding self-deployable fixed wing aircraft and those associated support equipments normally considered as a fly-in echelon. The AE was specified to be lifted by amphibious assault ships, with the AFOE lifted by common user sealift. The AFOE was scheduled to arrive by D+5, with an increment scheduled to arrive on D-Day. This case constitutes the "worst case" condition in terms of the amphibious lift short fall.

The following conditions define the scenario of the study:

(1) A notional MAF was deployed with no specific mission

(2) Transit time to the AOA was 8 days

(3) The amphibious assault consisted of two RLTs landed by helicopter at inland landing zones

(4) One RLT landed over the beach

(5) All support forces landed over the beach

(6) The beach was organized into one colored and two numbered beaches

(7) No time factors in ship loading were considered in the scenario

(8) The unloading problem in the objective area and beach clearing operations were considered part of the scenario

(9) The availability of common user sealift was assumed

(10) The troop list used for the analysis conducted in the study was the notional MAF containing the new CSS organization.

The following variation to the scenario was included:

(1) Deploy the MAF by escalating from an initial MAB deployment.

C. Amphibious Lift Capacity

The ships available to lift the AE of the MAF were provided to the project team by CNO (OP 323). Table IV-1 presents the ship types used throughout the study. This list contains all amphibious assault ships in one fleet and a force of ships from the other fleet, called the swing force. The total of the force is 59 ships, and 100 percent availability of the ships is assumed in the engaged fleet. This assumption may not be realistic, and an 80 percent availability of the ships in the

Table IV-1

SHIPS INVOLVED TO LIFT 1 MAF
FY-79

1 MAF Lift	From LANT To PAC	PACFLT Assets	TYPE	LANTFLT Assets	From PAC To LANT	1 MAF Lift
2	1	1	LCC	1	1	2
6	2	4	LKA	2	4	6
11	4	7	LPD	7	4	11
2	1	1	LPA	1	1	2
7	4	3	LPH	4	3	7
4	1	3	LHA	2	2	4
11	4	7	LSD	6	5	11
16	6	10	LST	10	6	16
59	23*	36		33	26*	59

*Size of Force Assumes 100 Percent Availability of Ships in the Engaged Fleet

engaged fleet may be more realistic. It should be noted that the force defined in the MMROP consists of 49 ships. The ship types for this total are found in Table IV-2.

Table IV-2

AMPHIBIOUS SHIP FORCE FROM MMROP

Ship Class	Number
LCC	2
LKA	4
LPD	9
LPH	5
LHA	5
LSD	8
LST	16
Total	49

This force, being less than the total for the swing force, may be closer to reality since it allows for some ship nonavailability.

The lift capacity of the ships used in the computer models of the study are listed in Table IV-3. The basic data source used to determine the ship lift characteristics were HQFMFPAC and HQFMFLANT pamphlets. These pamphlets differed in their definition of terms (Tables IV-4 and IV-5 contain this data). The data obtained from these pamphlets was further modified by ship plans available at SRI as they were applied to a ship loading/unloading model called GAMUT[1] that was used in the analysis of amphibious assault landing craft. The application of GAMUT in this study will be presented later in the report. Table IV-3 lists the lift

Table IV-3

(U) AMPHIBIOUS LIFT CAPACITY USED IN THE COMPUTER MODEL (U)

Order	Type	ID	Passengers	Sq Ft	MT	Barrels
1	LKA	30	226	43,025	3,158	0
2	LKA	31	226	43,872	3,153	0
3	LKA	32	226	44,062	3,153	0
4	LKA	34	322	23,871	1,343	0
5	LKA	48	226	38,100	1,825	1,276
6	LKA	49	226	38,100	2,093	1,276
7	LPA	33	1,374	10,322	613	0
8	LPA	47	1,331	9,137	2,764	4,114
9	LHA	2	1,903	28,000	3,802	563
10	LHA	2	1,903	28,000	3,802	563
11	LHA	2	1,903	28,000	3,802	563
12	LHA	2	1,903	28,000	3,802	563
13	LPD	7	947	12,500	1,564	0
14	LPD	8	927	13,300	1,576	0
15	LPD	9	858	13,700	1,188	0
16	LPD	10	861	12,400	1,413	0
17	LPD	11	875	11,000	1,243	0
18	LPD	12	859	13,200	1,440	0
19	LPD	41	925	13,100	873	2,849
20	LPD	42	863	14,000	1,326	8,871
21	LPD	43	1,863	13,600	1,111	8,380
22	LPD	44	861	18,400	549	8,381
23	LPD	46	922	14,100	404	8,871
24	LSD	13	333	4,455	0	0
25	LSD	14	323	4,455	0	0
26	LSD	15	316	4,455	0	99
27	LSD	16	314	4,455	0	0
28	LSD	17	337	4,455	0	0
29	LSD	18	337	4,455	0	0
30	LSD	19	337	4,455	0	0
31	LSD	50	316	4,455	0	1,153
32	LSD	51	308	4,455	0	761
33	LSD	54	337	4,455	0	780
34	LSD	55	337	4,455	0	822
35	LST	20	386	20,960	134	8,738
36	LST	21	386	20,960	134	8,738
37	LST	22	386	20,960	134	8,738
38	LST	23	386	20,960	134	8,738
39	LST	24	386	20,960	134	8,738
40	LST	25	386	20,960	134	8,738
41	LST	26	386	20,960	134	8,738
42	LST	27	386	20,960	134	8,738
43	LST	28	386	20,960	134	8,738
44	LST	29	386	20,960	134	8,738
45	LST	56	317	24,000	600	3,372
46	LST	57	393	21,000	525	8,784
47	LST	58	387	21,000	525	8,784
48	LST	59	396	24,000	600	5,628
49	LST	60	387	24,000	0	5,628
50	LST	61	387	23,780	0	5,628
51	LPH	3	1,771	4,766	1,434	6,333
52	LPH	4	1,764	4,338	1,296	6,333
53	LPH	5	1,815	5,886	1,272	6,333
54	LPH	36	1,970	5,567	1,472	6,489
55	LPH	37	1,948	7,370	1,444	7,060
56	LPH	38	1,933	6,781	1,342	6,909
57	LPH	39	1,801	6,349	1,143	8,863
	TOTAL			711,923*	47,192*	223,409

*Totals reduced by broken stowage factor.

Table IV-4

(U) HQFMFPAC SOURCE (U)

ID	Ship	Passengers	Cu Ft	Sq Ft	Sq Ft Add'l (X 1000)	
1	Blue Ridge LCC-19	281	0	2,800	Helo plat	5
					Flt deck	60
2	Tarawa LHA-1 (F)	1903	152,112	29,400	Hgr deck	21
					Well deck	19
					Hgr deck	13
3	Okinawa LPH-3 (F)	1771	57,366	4,766	Flt deck	45
4	Tripoli LPH-10 (F)	1764	51,820	4,338	-Do-	
5	New Orleans LPH-11 (F)	1815	50,882	5,586	-Do-	
					Well deck	8
6	Vancouver LPD-2	926	28,056	11,928	Helo plat	14
					Well deck	8
7	Ogden LPD-5	947	61,831	14,083	Helo plat	15
					Well deck	8
8	Duluth LPD-6	927	63,054	15,185	Helo plat	15
					Well deck	7
9	Cleveland LPD-7 (F)	858	47,525	15,618	Helo plat	15
					Well deck	7
10	Dubuque LPD-8 (F)	861	56,509	13,978	Helo plat	15
					Well deck	7
11	Denver LPD-9 (F)	875	49,699	12,104	Helo plat	15
					Well deck	7
12	Juneau LPD-10 (F)	859	57,614	15,025	Helo plat	15
					Well deck	18
13	Thomaston LSD-28	333	6,010	9,432	Helo plat	5
					Well deck	18
14	Pt Defiance LSD-31	323	5,523	9,012	Helo plat	5
					Well deck	18
15	Alamo LSD-33	316	3,957	8,268	Helo plat	5
					Well deck	18
16	Monticello LSD-35	314	4,473	8,960	Helo plat	5
					Well deck	20
17	Anchorage LSD-36	337	1,580	11,201	Helo plat	5
					Well deck	20
18	Mt Vernon LSD-39	337	1,580	11,201	Helo plat	5
					Well deck	20
19	Ft Fisher LSD-40	337	1,580	11,201	Helo plat	5
20	Fresno LST-1182	386	5,370	20,960	Helo plat	2.6
21	Peoria LST-1183	386	5,370	20,960	Helo plat	2.6
22	Frederick LST-1184	386	5,370	20,960	Helo plat	2.6
23	Schenectady LST-1185	386	5,370	20,960	Helo plat	2.6
24	Cayuga LST-1186	386	5,370	20,960	Helo plat	2.6
25	Tuscaloosa LST-1187	386	5,370	20,960	Helo plat	2.6
26	San Bernardino LST-1189	386	5,370	20,960	Helo plat	2.6
27	Racine LST-1191	386	5,370	20,960	Helo plat	2.6
28	Barbour Cty LST-1195	386	5,370	20,960	Helo plat	2.6
29	Bristol Cty LST-1198	386	5,370	20,960	Helo plat	2.6
30	Durham LKA-114	226	126,329	43,025	Helo plat	5
31	Mobile LKA-115	226	126,114	43,872	Helo plat	5
32	St Louis LKA-116	226	126,107	44,062	Helo plat	5
33	Paul Revere LPA-248	1374	24,524	10,322	Helo plat	4
34	Tulare LKA-112	322	53,706	23,871	Helo plat	4

Table IV-5

HQFMFLANT SOURCE

ID	Ship	Passengers	Cu Ft	Sq Ft
35	Mount Whitney LCC-20	627	24,408	3,426
36	Iwo Jima LPH-2	1970	58,883	5,567
37	Guadalcanal LPH-7	1948	57,746	7,370
38	Guam LPH-9	1933	53,687	6,781
39	Inchow LPH-12	1801	45,707	6,349
40	Raliegh LPD-1	931	84,094	11,000
41	Austin LPD-4	925	34,934	14,848
42	Coronado LPD-11	863	53,055	16,093
43	Shreveport LPD-12	1863	44,456	15,564
44	Nashville LPD-13	861	42,319	21,975
45	Trenton LPD-14	924	48,951	13,754
46	Ponce LPD-15	922	53,263	16,184
47	Francis Marion LPA-249	1331	110,570	9,137
48	Charleston LKA-113	226	79,983	38,100
49	El Paso LKA-117	226	83,714	38,100
50	Plymouth Rock LSD-29	316	N/A	26,371
51	Port Snelling LSD-30	308	N/A	27,525
52	Spiegel Grove LSD-32	273	N/A	28,746
53	Heritage LSD-34	265	N/A	30,412
54	Portland LSD-37	337	N/A	32,269
55	Pensacola LSD-38	337	N/A	32,269
56	Newport LST-1179	317	N/A	24,000
57	Manitowac LST-1180	393	N/A	21,000
58	Sumter LST-1181	387	N/A	21,000
59	Saginaw LST-1188	396	N/A	24,000
60	Boulder LST-1190	387	N/A	24,000
61	Spartanburg County LST-1192	386	N/A	23,780
62	Fairfax County LST-1193	386	N/A	24,094
63	La Moure County LST-1194	345	N/A	24,094
64	Harlan County LST-1196	294	N/A	24,094
65	Barnstable County LST-1197	294	N/A	22,000

data used in the Transportation Feasibility Estimator (TFE) Model and the Constrained Cargo Factoring Model, which are also explained in a later section of this report.

The following considerations were used in determining the data in Table IV-3:

Well deck space was used for boats of the Assault Craft Unit and LVTs. The square loading capacity assigned to well deck spaces was based on preloading the boats. A broken stowage factor of .6 was used in loading vehicles into boats. The square feet of the boats and LVTs was not included in the unit's cargo totals holding this materiel.

Helicopter platforms, flight deck, and hangar deck spaces were not included in ship loading capacity. Aircraft were not included in lift requirements for squadrons.

Due to the nature of the cargo found in the AE of the MAF, the models of this study were designed to convert excess square loading space into bulk cargo, if available. No square loaded cargo was permitted to be loaded into bulk stowage spaces. Broken stowage factors were assigned as follows:

(1) Bulk BSF = .8

(2) Square BSF = .75.

The passenger and bulk fuel cargo categories were not included in the analysis of this study.

No special considerations were made for loading ammunition or handling supply class V separately. Investigation of ammunition stowage spaces revealed that sufficient space existed with the ships of the force supporting the AE of the MAF. An assumption is therefore made that ammunition will be stowed separately in assigned spaces. Any unused space resulting from an

insufficient amount required on separate ships was not allowed in the model. Therefore, class V was included in the total bulk for loading, and all ammunition spaces were included in ship capacity.

The helicopter loading problem on the LHA and LPA type ship was not included in this study. Only personnel and all other material for units having aircraft was considered in the loading analysis.

D. Amphibious Lift Requirements

Before the comparison of lift capacity with lift requirement can be made, cargo totals for the MAF must be established. Table IV-6 presents two notional MAF lift requirement cargo totals. In the table the cargo totals for the notional MAF are derived from a troop list provided to the MAGTF Project by the Study Advisory Committee. With some alterations, the troop list used for this MAF is the same as in the MAGTF Project. At the beginnings of this study, this MAF was adopted as the base case for all analysis. Table IV-7 provides an outline of the organizational structure of this MAF. At the end of Phase I of the study, the project team was advised that a new organizational structure for combat service support[2] (CSS) was adopted for integration into the FMF. Research was begun at that time to develop cargo data for a notional MAF that included the new CSS structure. The organizational structure in outline form for the CSS MAF is listed in Table IV-8. The detailed troop lists for these MAFs are found in Appendix B. As shown in Table IV-6, cargo lift requirements for the two notional MAFs are considerably higher than the data presented in the MMROP for the same MAF troop list. The significant differences between the MMROP data and the other raises the question of data validity. This subject will be discussed in detail in Section V. The troop list for a notional MAF provided in the MMROP differs from those used in MAGTF by including two TOW Co, a Tank Bn, and two 155mm How Btry, FAG. The

Table IV-6

NOTIONAL MAF SOURCE COMPARISONS

	Notional	CSS Notional
		AE
Bulk, MT*	82,906	77,624
Square, sq ft	870,856	786,926
		AFOE
Bulk, MT*	105,749	189,009
Square, sq ft	658,076	648,209

*Measurement Tons

Table IV-7

NOTIONAL MARINE AMPHIBIOUS FORCE (MAF)

Assault Echelon

- Command Element
  - Radio Bn
  - Communications Bn
- Ground Combat Element
  - Marine Division
  - Tank Bn
  - AMTRAC Bn
  - Field Arty Grp
- Aviation Combat Element
  - MACG
  - 2nd MAG (VH)
- Combat Service Support Element
  - Medical Bn
  - Service Bn
  - Shore Party Bn
  - Military Police Bn /-/
  - Engineer Bn /-/
  - Det FSR

Assault Follow-On Echelon

- Command Element
- Aviation Combat Element
  - LAAM Bn
  - MWSG
- Combat Service Support Element
  - Det Serv Bn
  - MT Bn
  - Det Engr Bn
  - FSR

Fly-In Echelon

- Aviation Combat Element
  - Det 3rd MAG

Table IV-8

CSS NOTIONAL MARINE AMPHIBIOUS FORCE (MAF)

<u>Assault Echelon</u>

Command Element
- Radio Bn
- Communications Bn

Ground Combat Element
- Marine Division
- Tank Bn
- AMTRAC Bn
- Field Arty Grp

Aviation Combat Element
- MACG
- 2nd MAG (VH)

Combat Service Support Element
- Medical Bn
- Div Serv Spt Grp
- Military Police Bn
- Engineer Bn /-/
- Det FSSG

<u>Assault Follow-On Echelon</u>

Command Element

Aviation Combat Element
- LAAM Bn
- MWSG /-/

Combat Service Support Element
- MT Bn /-/
- Det Engr Spt Bn
- FSSG /-/

<u>Fly-In Echelon</u>

Aviation Combat Element
- Det 3rd MAG

source for the cargo data of the notional MAF and the version containing the new CSS structure was the MAGTF System.

E. Amphibious Lift Short Fall

The MAF lift data presented herein was compared with the amphibious lift capacity to obtain an understanding of the extent of the lift short fall. The data provided by the MAGTF System for the assault echelon of the MAF, when compared to the lift capacity of the 59-ship force used in the study, indicates a lift short fall of 40 percent for bulk cargo and 10 percent for square loaded cargo. Based on data from the present study, only 60 percent of the AE of the notional MAF will fit in the available ships. The lift data contained in the MMROP indicates that all AE cargo for the same MAF can be lifted by the 59-ship force.

These results reveal the extent of the problem facing the amphibious planner. The completion of the MAGTF System project in January 1975 made possible the undertaking of the study now being reported. The foundation of all study results to be presented herein is based on the data generated by the MAGTF System. Therefore, Section V presents an analysis of landing force materiel in order to substantiate the results obtained from the entire study.

F. Conclusions

The following conclusions are presented based on the MAGTF System data:

(a) The cargo lift requirement for the assault echelon of a representative MAF, as presented in the MMROP, is significantly less than that computed by the MAGTF System. (Page IV-10.)

(b) Based on the MAGTF System Data, an amphibious lift short fall of approximately 40 percent would occur when loading the assault echelon of a notional MAF into the available amphibious assault ships used in this study. (Page IV-14.)

In summary, this section has provided the framework for conducting the study from the scenario description. The data used to represent amphibious lift capacity for the study was provided along with a statement of MAF lift requirements. The extent of the amphibious lift short fall was then presented, highlighting the magnitude of the problem to be solved within this study.

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1. A. R. Grant; "Systems Analysis of Amphibious Assault Landing Craft"; NWRC/MSO-RM-67, Stanford Research Institute, Menlo Park, California; 1973.

2. W. L. Edwards, H. B. Wilder, T. H. Allen, W. Schubert, and J. L. Brenner; "Organization and Operation of Combat Service Support Elements of the Fleet Marine Forces (1975-1980)"; Naval Warfare Research Center, Stanford Research Institute, Menlo Park, California; March 1974.

V ANALYSIS OF LANDING FORCE MATERIEL REQUIREMENTS

A. General

An accurate statement of the cargo lift requirement for the assault echelon of a MAF configured for an amphibious assault is essential before the adequacy of the amount of assault shipping can be determined. The previous section illustrated the variety of assessments of amphibious lift capacity that can result from vastly dissimilar statements of lift requirement. Cargo lift requirements were presented for two notional MAFs generated from the MAGTF System. It is therefore necessary to substantiate the data used in this study that was obtained from the MAGTF System.

A major part of project work was devoted to an improvement effort of the MAGTF Program and to data base update to enhance system processing time and data accuracy. Results of these efforts are reported in this section. An explanation of the nature and composition of MAGTF data output is presented to provide an understanding of MAGTF data, which is expected to establish its validity.

Various adjustments to materiel of the MAF may have impact on lift requirements during the 1976-1980 time period. Research into these areas was among the tasks of the study. Results from this work are presented in this section.

B. The MAGTF System

1. MAGTF Improvement

The MAGTF System[1], when installed on the HQMC computer, processed the first MAF using as input the troop list of the notional MAF found in

Appendix B. The processing time was about 63 hours. The restart procedure designed in the MAGTF Program permitted processing the MAF in 2- to 8-hour increments. The output from this run indicated minor errors in the data base and the program code. At the beginning of this project, the MAGTF System was also operational on the SRI CDC 6400 computer. Since MAGTF was required to provide the data for this project and the processing time was excessive, a task was included and approved in the study outline plan to conduct a limited program modification to the MAGTF Program for the purpose of reducing processing time. This task also included the correction of any processing errors found in the program as the result of extensive use of the output. When completed, this effort reduced the running time of the same troop list to 15 hours. (The actual time will vary according to the number of programs processing simultaneously in the computer.)

The new version of the MAGTF Program was installed on the HQMC computer when completed. Use was made of the Naval Postgraduate School, Monterey, California, Computer Center for debugging and processing most production runs needed for the study. Appendix G provides a complete explanation of the MAGTF improvement task. Although a dramatic reduction in processing time was achieved during this effort, further modifications, identified as the result of this work, are expected to reduce processing time by at least 50 percent. When processing a MAF in 5 to 7 hours becomes possible, extensive use of the capabilities of the system will be feasible on the larger MAF computer available in the FMF.

2. MAGTF Lift Composition and Validity

The MAGTF System provides the lift expression, i.e., total cargo requirements, for all units in the FMF for which T/Os and T/Es exist in Marine Corps automated files. There are two types of units in the MAGTF

data base; these are major units and basic units, which are defined in the MAGTF System to be:

- Basic unit--companies, batteries
- Major unit--any organizational level having "basic units" as subordinate units, i.e., battalions and higher level organizations.

The following explanation of unit lift data applies to the basic unit. Lift data for major units is obtained from processing subordinate basic units. Appendix B contains two simple basic unit listings which can be used for reference during the following discussion.

Cargo data for a basic unit consists of initial issues and mountout. Included in initial issues are garrison operating stocks which are a function of theater peacetime training allowances obtained from the Item Data File (IDF). The MAGTF System defines garrison operating stocks for supply class IX only. Initial issues consist of T/E items obtained from the HQMC Equipment Allowance File (EAF), which is the source of the printed USMC T/E listing. The T/E is composed of supply classes IIW and VIIW and limited IV. The MAGTF data base receives the same allowance as the printed T/E for any basic unit. In addition to ground equipment, supply classes IIA and VIIA are included in initial issues for aviation units. Data for classes IIA and VIIA, ground support equipment (GSE), were obtained from the ADMRL File provided to SRI by the Aviation Materiel Office, Norfolk, Virginia. Supply classes VIIW and VIIA are further separated into square loaded and non-square loaded items for embarkation purposes. The beds of all trucks and trailers contained within basic units are used as mobile loading capacity. The MAGTF Program uses this space to mobile load designated cargo of all eligible supply classes of the unit, thereby providing an accounting for utilized and nonutilized mobile loading space. The weight and dimensions for all class IIW, VIIW, and some VIIA items contained in the MAGTF data base were obtained

from a 2-year data gathering and validation task within the MAGTF Project. The MCDEC Project Officer conducted this extensive effort, which is the foundation of the MAGTF data. Continuous updating and correcting efforts since 1974 have achieved an accuracy of over 90 percent for this data. This effort, of course, never ends so long as the system is in continuous use. Sample listings for initial issues by supply class are found in Appendix B, "MAGTF Sample Output."

The second cargo category for the basic unit is mountout. This category consists of all nine classes of supply. For explanatory purposes, mountout is composed of five separate categories. The first category includes supply classes I, VI, and VIII. Data for this group of supply classes included in the MAGTF System was derived from the Table of Authorized Materiel (TAM) and from the MAGTF Project Officer at the Marine Corps Development and Education Command (MCDEC), Quantico, Virginia. The values for weight and cube inserted in the MAGTF data base were therefore based on Marine Corps and Navy authorized planning factors for 1 day of supply (DOS). All data computed by the MAGTF System in this category was validated by the project team and by a validation committee at MCDEC before completion of the MAGTF Project.

The second category within mountout consists of supply class III. The MCDEC Project Officer provided a deck of all Marine Corps TAM items for classes IIW and VIIW that consume fuel or have a mobile loaded item that consumes fuel. The data provided included gallons per hour and average hours per day for the type of fuel consumed for each TAM item. From this source the total gallons per day for each type of fuel consumed per TAM item was computed and entered into the MAGTF data base. Included was all packaged grease, gear lube, and engine lube, which were computed as functions of the total gallons of gasoline and diesel as specified by the TAM. Class III consumables of all types were entered for all aircraft

types from data provided from the MCDEC Project Officer (see Appendix B for sample MAGTF listings).

The third mountout category is supply class V. Data for this class was entered directly into the MAGTF data base from Marine Corps Order 8010.1B. This data provides the basic allowance for each DODIC fired by each weapon or individual. The mountout assault rates and sustaining rates for these DODICs were obtained from the IDF. A unit's ammunition load consists of the basic allowance and the specified number of DOS of mountout. Values computed by MAGTF have been validated by the MCDEC committee (see Appendix B for sample listings for class V). Class VA was obtained in a clsssified version for each aircraft. To avoid complicating the handling, the detailed classified data was not entered into the data base. An unclassified version of total weight and cube for each aircraft was computed and included in the data base.

The fourth category in mountout is supply class IX. Data for this class was obtained from the Marine Corps Supply Activity, Philadelphia, which provided methods of calculating the weight and cube of all repair parts needed to support an end item for all echelons of maintenance for one day. The automated files provided, unfortunately contained repair parts for only about one-third of the end items. Included in the class IX category are the secondary reparables with subclass designation of R-Code and D-Code. Data for these items was provided on magnetic tape. The information on this tape was extracted by program totals calculated for the MAF and loaded into the data base. This cargo requirement is included in the supply company detachment of both MAF lift expressions.

The last categories are classes IIW and VIIW. The mountout computed for these classes was based on the combat active replacement factors contained in the TAM and the T/E allowances. Sources for these

items were the EAF and IDF automated files. Materiel obtained for classes IIA and VIIA as initial issues includes 90 days mountout by definition. Therefore no additional materiel for aviation was included in mountout.

Now that MAGTF data has been explained, the organization of cargo for loading may be presented. For each basic unit, cargo is composed of the unit load and landing force supply. The unit load consists of the initial issues and a prescribed number of DOS for mountout. The MAGTF Program calculates the unit mountout cargo to the desired number of DOS as directed by the landing force commander. In this study five DOS have been specified for mountout accompanying the unit. This value was included, along with other parameters, for cargo computation. Although the DOS for mountout contained in the unit load may be greater than can be transported by organic means, as defined by the "prescribed load[2]," the excess cargo will still require handling as landing force supply. The specification of the DOS for unit load does not change total lift requirement for the AE. The effect is mostly felt in the total cargo required for initial helicopter lift in the short run, but does not affect total cargo helicopter lift requirements over the period of the assault phase.

Aviation units having aircraft contain GSE equipment for OMA and IMA support as computed by the MAGTF Program. The IMA materiel is always held by the H&MS in reality. This category of classes IIA and VIIA is stored in the MAGTF data base by aircraft rather than by unit due to the organization of the source data file.

Landing force supply contains all classes of supply found in mountout by the specified numbers of DOS. For the AE of this study, 10 DOS were assigned. Landing force supply is computed for each unit based on its requirement, even though this materiel is consolidated for

handling in loading and unloading. The materiel is, of course, loaded throughout the ships of the amphibious task force.

The final category of materiel is the operational readiness float of major end items. The EAF has provided a source for float computations to support a MAF. The data for this float was obtained but consisted of class VIIW items only. A figure of one-third the total number of items was assigned to the AE, with the remainder assigned to the AFOE. The supply company detachment was assigned the extra square loading items for accounting purposes.

Table V-1 provides a graphic representation of MAGTF cargo data organization as previously explained. This representation does not reflect relative size of the cargo, but only the supply class breakdown in each category of the AE lift expression.

When an amphibious operation is planned for the climatic conditions of desert, cold weather, or Arctic, an additional amount of materiel can be provided to the lift expression by setting an input parameter to the MAGTF Program. The additional cargo will be mainly supply class IIW, type 3, and class III, containing an additional amount of fuel for stoves and other fuel consumers found in T/Es for these climatic conditions. This capability was not used in this study. The effect of an extreme climatic condition is a dramatic increase in lift requirements.

3. Data Base Update

The Study Outline Plan included a task for a limited update of parts of the MAGTF data base. It was desired to have as accurate a representation of lift as possible within the time constraints of the study. An update from three primary source tapes was accomplished.

Table V-1

ASSAULT ECHELON LIFT SUPPLY CLASS ORGANIZATION

Unit Load	Landing Force Supply
I, IIW, III, IV, V, VI, VIIW, VIII, IX - 5 DOS Mountout -	I, IIW, III, IV, V, VI VIIW, VIII, IX
VIIW Square Loaded - 5 DOS Mountout -	- 10 DOS Mountout -
Operational Readiness Float IIW, IIA, IV, VIIW, VIIA - T/E -	VIIW Square Loaded
VIIW, VIIA Square Loaded - T/E -	- 10 DOS Mountout

Personnel adjustments are constantly occurring in the T/Os of various units. The Table of Manpower Requirements (TMR) Automated Master Line File is the source for T/Os in the MAGTF data base. Distribution of these files includes NWRC/SRI. Three separate updates from the TMR were accomplished during the study. The last update included all new CSS and aviation units recently placed in the file.

The next major update was from the EAF, which made current the T/Es of units in the MAGTF data base. Three complete updates from this file were accomplished, including the new CSS and aviation units.

Three updates by manual preparation methods were also completed. These updates included a group of TAMs, for which weight and dimensions were not previously available, and corrected all data base errors discovered from the continuous use of the output listings.

The following sources for update were not obtained, or were not accomplished due to reprogramming requirements which could not be performed in the time frame of the study:

(1) Aviation repair parts

(2) ADMRL File GSE Data

(3) Table of Basic Allowance (TBA) File

(4) Ground repair parts.

In effect, no update of aviation materiel was possible. Data was obtained for ground repair parts, but the extensive programming effort necessary could not be accommodated within the time constraints of the study.

4. Data Base Deficiencies

Certain deficiencies in MAGTF data remained at the conclusion of the MAGTF Project. These deficiencies cause an understatement of the lift requirement. The error in MAGTF output, therefore, causes the lift expression to be less than total requirements. These deficiencies were not corrected during the MAGTF Project due to extreme difficulties encountered at the time. Each deficient area is explained below, along with the corrective measures taken.

The designation of certain items in supply class VIIA as square loaded equipment, obtained from the TBA File, was not accomplished. This problem also occurred to a limited degree for GSE items as well. An estimate of 1000 square feet was added to each unit having aviation equipment to partially correct this deficiency.

Supply class IIIA failed to include fuel requirements for GSE fuel consumers. Estimates of the fuel requirement for each aircraft having this type of equipment was added to the MAGTF data base.

As previously mentioned, class IXW, repair parts were initially obtained for about one-third of the end items in unit T/Es. This means that class IXW is understated by about two-thirds. At the time the repair part data was obtained from MCSA, that was all the coding accomplished for this huge data source. A new tape and format were received upon request from MCSA. After examining the programming work required to extract this data, it was decided time was not available to conduct this task within the current study. The MAGTF Program computes up to fourth echelon maintenance requirements for repair parts for each unit. Of course, the unit has maintenance responsibilities of various levels. The MAGTF listing provides the data for class IXW, indicating the amount actually attributed to the unit's requirement and the amount actually carried by supporting maintenance organizations.

Supply class IXA GSE repair parts were never included in MAGTF data sources for entry into the data base during the MAGTF project. Estimates for these items were also obtained during the present study and included in the data base. All estimates of GSE fuel and repair parts were obtained from 3RD MAW units.

Airframe and engine repair parts were originally obtained from 16 tapes received from ASO, Philadelphia, during the MAGTF Project. Of these tapes many records were lost due to parity errors occurring in computer system processing. This category therefore is understated by an unknown degree.

All MAGTF listings for units and totals contain some obsolete supply class VIIW items in unit T/Es. These items were not removed during updates from the EAF files due to interface problems with the source file

and the MAGTF data base. A modification to the EAF LOAD peripheral program will be necessary to eliminate the obsolete TAM items when conducting a routine EAF or T/E update. These obsolete TAM items were identified during this study and were removed from unit lift requirements by computer programs processing the data for the current study.

5. Comparison of MAGTF Lift Data With MEDS

During the project, MAGTF data was compared with that obtained from an external source within those supply classes having any commonality. A comparison was made with the Marine Embarkation Data System (MEDS) obtained from units in I MAF.

Four units were used to conduct the "spot check" comparison of MEDS data with MAGTF for supply classes II and VII. The MAGTF lift for classes IIW and VIIW nonsquare were compared between units of the same T/O and T/E as obtained from the MEDS listings, as well as class VIIW square loaded. For T/E M3243, the engineer maintenance company, a 16 percent reduction from MAGTF data was observed for class VIIW square loaded items and a 39 percent reduction in classes IIW and VIIW nonsquare. The numbers in this comparison are not important in themselves. The significant factor is that for whatever reason, MEDS is usually below T/E requirements due to either an incomplete MEDS deck or the existence of T/E deficiencies. Spot checks of other units revealed the same relative differences from MAGTF. Other supply classes and mountout are not included in MEDS, thus preventing a total comparison. When comparing a MEDS listing of aviation units, nothing conclusive could be determined due to very different definitions of cargo categories in the MEDS data.

6. Notional MAF Amphibious Lift Expression

The preceding paragraphs have presented the explanatory information outlining the source, composition, adjustments, and validity of the MAGTF System data. In Section IV the total lift requirements and the troop list for the notional MAF were presented. The MAGTF lift expression for the notional MAF is a multivolume document. Copies of these computer output listings are available at NWRC/SRI and at HQMC (Code LPS). The computer system developed for data analysis in this project prepares the lift expression computed from JOPS cards, the automated output of the MAGTF Program. This lift expression is the statement of cargo requirements used in the analysis presented in the next two sections of this report. The units in the notional MAF troop list and their cargo lift requirements are listed in Table V-2. The values for measurement tons of bulk cargo and square feet of square loaded items in Table V-2 were calculated from JOPS cards and adjusted as previously explained. These figures have been reduced from values in the MAGTF listings to compensate for total utilization of unit mobile loaded capacity. This compensation simulates the allocation of vehicles to other units requiring additional mobile loading support.

The amphibious lift cargo totals generated by the MAGTF System are dependent on parameters defined for the program upon execution. Knowledge of these parameters is essential for fully understanding the lift totals. Table V-3 lists the parameters used in all notional MAF runs used in this study. The parameters shown in the table cause the following actions in the lift requirement:

(1) Loads 2 DOS of diesel and MOGAS into drums as part of the unit load.

(2) Loads all JP fuel into the bulk category for the AE and AFOE. (Tankers of units generating JP fuel would of course be fully loaded. All other fuel type tankers and cans would also be filled.)

Table V-2(a)

NOTIONAL MAF ASSAULT ECHELON LIFT REQUIREMENT

Unit	Quantity*	MT†	Square†	Barrels†	PAS
CMD-GP	1	3737	86488	4755	2155
M1988	1	936	23004	1340	1368
M1038	9	1014	4427	453	1230
M1096	3	186	4663	491	184
M1128	3	1678	23016	1170	707
M1196	1	969	17364	1208	278
M1378	1	8843	43671	4000	773
M1423	4	437	69	19	85
M1427	1	115	6470	283	130
M1653	3	34	8409	358	79
M1657	1	42	1918	94	58
M4233	4	906	6531	453	110
M4237	1	847	16382	774	313
M4652	4	110	15292	1491	229
M4654	1	226	11536	943	253
M4226	1	677	8661	528	177
M4112	1	664	14469	736	225
M4193	2	417	10497	528	177
M4201	1	67	2019	170	120
M0601F	1	35	0	0	212
M0604F	1	668	11024	906	257
M8821	2	87	2181	208	73
M8612	1	288	21433	1358	419
M8615	1	774	7403	849	217
M8625	1	126	4297	208	284
M8631	1	637	14889	1585	271
M8640	1	283	10912	1208	234
M8914	2	275	5522	283	405
M8921	2	3238	17237	1283	390
M8621	1	309	6578	264	120
M8937	5	1222	4584	1849	248
M8944	3	1264	5480	3604	345
M8964	2	1134	4536	1302	278
M8968	1	1248	4817	1509	231
M8970M	1	1214	4938	1642	391
M8859	1	2056	7386	8755	372
M0300F	1	136	5432	283	256
M1523	4	93	2869	170	98
M1557	1	174	3015	189	146
M0301F	1	632	9096	358	333
M1743	1	542	16307	1113	404
M1753	1	75	16410	698	132
M0303F	1	952	5137	302	176
M1863	3	57	575	38	66
M1867	1	1404	18715	830	314
M4903	3	35	605	38	120
M4907	1	96	6296	358	182
M4353	2	182	8927	358	165
M0305F	1	212	11914	736	120
M0307F	1	24	571	38	82
M3223	1	409	19204	566	249
M0312F	1	169	6495	170	195
M3243	1	218	5046	151	159
M0314F	1	14	520	19	36
M3253	1	2846	7662	170	128
M0322F	1	2882	22867	19	118
M0324F	1	534	836	170	48
M3333	1	2401	7716	755	370
M0326F	1	105	743	38	129
M0332F	1	18	585	38	98
M0701F	1	6482	2701	66	914

*Amounts listed are for one (1) unit; multiply by Quantity for total lift requirement.

†MT = 82906 Sq = 870856 Bl = 87057
Computed totals have been adjusted by removal of obsolete TAMs.

Table V-2(b)

NOTIONAL MAF ASSAULT FOLLOW-ON ECEHLON LIFT REQUIREMENT

Unit	Quantity*	MT†	Square†	Barrels†	PAS
M4722	1	17	919	200	16
M4392	1	114	2550	800	53
M0602F	1	30	0	0	66
M0605F	1	153	3086	500	77
M8820	3	4712	19439	14200	479
M8620	1	3204	23664	6800	360
M8621	2	581	7013	1400	120
M8710M	1	2998	18589	10300	612
M8715	1	15065	32696	23900	265
M3333P	1	2422	7875	4200	388
M4343	1	7056	32597	2100	185
M4903	1	102	610	300	120
M4512	1	204	2677	1700	122
M4552	4	133	1814	1000	71
M4592	1	266	3897	2100	250
M0304F	1	8	168	0	13
M0302F	1	16	107	0	31
M4643	3	276	10332	2100	82
M4644	1	437	20885	2300	97
M4647	1	184	3925	1500	70
M4353	2	366	8545	2000	165
M0306F	1	441	12763	4200	116
M0308F	1	1470	11707	3300	136
M3213	1	102	1695	300	80
M0313F	1	272	5985	1100	198
M0315F	1	271	16381	3200	121
M0323F	1	314	46219	900	272
M0325F	1	1767	2569	3100	187
M0327F	1	389	2817	900	237
M3346	1	217	9386	1900	155
M3403	1	193	2755	900	243
M3413	1	991	66372	9900	276
M0333F	1	2466	10136	2100	255
M3443	1	251	4531	1300	257
M3447	1	4695	21624	12400	384
M0702	1	4893	53658	0	763
M0603F	1	13	0	0	4
M8712	1	62	831	200	49
M8652	1	674	11244	62500	122
M8780M	1	1650	7642	64300	429
M8813	3	824	8699	11400	484
M8855	2	6185	7680	26500	227
M8857	2	5269	9417	38700	355
M8849	4	2393	6885	51100	320

*Amounts listed are for one (1) unit; multiply by Quantity for total lift requirement.

†MT = 105749 Sq = 658076 Bl = 657900
Computed totals have been adjusted by removal of obsolete TAMs.

Table V-3

MAGTF PROGRAM INPUT PARAMETERS

Parameter	Value
DOS for MAF	60
DOS for AE	15
DOS for AE Unit Load	5
DOS for AE Landing Force Supply	10
DOS for AFOE Landing Force Supply	55
AE DOS for Drummed Fuel	2
AFOE DOS for Drummed Fuel	0
DOS JP Fuel AE Unit Load	0
DOS JP Fuel AE Landing Force Supply	15
DOS JP Fuel AFOE Unit Load	0
DOS JP Fuel AFOE Landing Force Supply	60

All values used in these input fields are options for the user. The values selected were provided by the Study Advisory Committee, HQMC.

7. Summary

The purpose of this discussion on the MAGTF-System-generated cargo data was to emphasize the fact that MAGTF data was designed to include every cargo category required to support the MAF in the amphibious assault. The AE totals obtained from MAGTF data are larger than previously thought, since earlier estimates were based on older lift expressions. The lack of information necessary to state the complete lift expression in former years led to the planning and execution of the MAGTF Project. Proposals have been submitted to HQMC (Code RDS) for

improving MAGTF processing time and to correct all known MAGTF data base deficiencies. After using the MAGTF System extensively during the current project, it is possible to state that the system was adequately designed for content, and with proper maintenance on a day-to-day basis, the data base will easily reach an accuracy of over 95 percent.

Having discussed the data to be used throughout the computational portion of this report, the next subject to consider is the materiel adjustments recently completed and proposed for future changes to unit materiel that have and will have an impact on MAF lift requirements.

C. Materiel Adjustments

This section will present findings relative to the possible effect on the MAF lift cargo requirements of certain materiel adjustment that may be made in unit materiel. Research into six areas was conducted to determine these effects, if any. The data from the research will be presented in this section, with the effects on overall MAF lift included in Section VII.

1. T/E Reductions

One of the first research tasks conducted in the study was the examination of a sample of T/Es selected from FMF units to determine the existence, if any, of nonessential equipment. Results from this effort were planned to be used for making inferences relative to other units of the MAF. The term "nonessential equipment" was interpreted to mean equipment no longer required to support any current or anticipated mission or function, either by the quantity of the item on the T/E or the lack of usefulness for any reason. The purpose of this task was to determine if any significant reductions of materiel were possible in support of the first objective of the study, namely, to find areas where feasible reductions of materiel were possible without reducing operational readiness or sustainability of units in the MAF.

The units listed in Table V-4 were those selected for analysis.

Table V-4

UNITS SELECTED FOR T/E REDUCTION ANALYSIS

Unit T/E	Description
M1038	Inf Bn
M1128	Arty Bn
M1758	Serv Bn
M1658	Mt Bn
M3233	Mt Maint Co, FSR
M3243	Engr Maint Co, FSR
M3253	Comm/Elect Maint Co, FSR
M8813	H&MS
M8847	VMFA

This task was conducted by making visits to units in I MAF at MCB, Camp Pendleton, and MCAS, El Toro, California, and interviewing knowledgeable personnel in each of the type units listed above. A discussion was held with those personnel on each item of the latest T/E (just received during April 1975) for the first four units visited. Results achieved during the visits to the first four units indicated that general discussions of T/E essentiality would be adequate when visiting the other units. Personnel interviewed were commanding officers, operations officers, logistics officers, maintenance officers, and division, wing, and MAF staff personnel. Enthusiastic support of the research task was evidenced by all personnel contacted.

Initially, results expected from this task were lists of items to be deleted from unit T/Es. With one exception, the unit T/Es analyzed

contained only insignificant numbers of items that could be considered nonessential. In every unit visited, the existence of T/E review efforts was evident from the precisely stated usefulness of all items contained in T/Es. Actions had been or were in the process of being taken to update T/Es to reflect exact requirements. The unit whose T/E review produced significant materiel reduction recommendations was a maintenance company originally configured to separate into more deploying detachments than experience ever required, thus additional sets of test and repair equipment were included beyond any current support requirements. No reduction actions were forthcoming from that unit for two reasons. First, the unit never deploys as a complete company and is therefore a tailored detachment when part of a MAGTF. Second, the implementation of the new CSS organizational structure eliminates this unit as a source of detachments for future troop lists.

The information obtained in conducting this task failed to provide grounds for obtaining permanent T/E reductions from which lift requirements could also be reduced. The important fact gleaned from this task was that many items in the T/E were useful in some types of operations and not needed in others. If any item had a use in at least one possible circumstance, then it was not considered for elimination. Since the controlling factor in this analysis was the preservation of operational readiness and sustainability of the unit, these factors would be unaffected if items not needed for an operation were excluded from the unit load. The eliminated items could be left in garrison or be included in the landing force supply of the AFOE, to be redistributed after D+5 at some convenient time. A detailed analysis[3] of combat essentiality conducted at NWRC/SRI found unit T/Es to be comprised of three mission essentiality categories. These are primary, secondary, and tertiary missions. A manageable latitude of what equipment to include in the unit load of an AE unit faced with constrained loading problems was

found to exist. A collateral consideration is that any equipment eliminated from the unit load embarked in assault shipping would be unavailable to the unit only from D-Day to D+5, plus unloading time if it were included in the AFOE cargo. These findings led to the development of a systematic procedure to eliminate T/E items from a unit in a constrained assault shipping environment based on a criticality assessment of the T/E. The criticality factors used in such a procedure would be based on the mission essentiality categories previously discussed. These findings, along with the fact that units usually deficient to some degree in T/E items for a variety of reasons are still capable of accomplishing their missions, substantiate the approach to solving the problem of deciding how to configure the AE of the MAF or MAB or even a MAU when less assault shipping is available than lift requirements for a selected troop list. A solution procedure consisting of mathematical models designed as a computer assisted decision aid is presented in the study, i.e., the development of a materiel weight and cube control process. It was considered necessary to determine the effect on the lift requirement of the notional MAF used in the study from the introduction of new materiel into the T/Es of units contained in the MAF troop list. The results of this research are presented in the next section.

2. New Materiel

The time frame of this study includes the period to 1980. Materiel changes are constantly in progress within the Marine Corps. This incorporates upgrading equipment to stay abreast of the latest technological developments, which is in line with the third objective of the study. Results from the task were only partially successful due to a lack of available data. A task was planned to determine the difference in lift that could be expected from introducing the planned TAM[4] items into the T/Es of units. Precise results were not obtained from this

effort because of the small number of planned items for which embarkation data was available and the high cost of obtaining these limited results from large computer tape files. However, an analysis of the trend in lift requirements for planned items was conducted without consideration of the quantities to be included in T/Es. This analysis consisted of comparing planned (P) TAM items with those TAM items being replaced in T/Es. The comparison included only the cube for bulk loaded items and square feet for square loaded items. Table V-5 lists the TAM numbers and the cube for the replacement TAMs and the P TAMs. Information extracted from the IDF indicated that one P TAM was often replacing more than one replacement TAM. Results from this analysis show an increasing trend in cube. An increase of 2272.36 cubic feet was obtained from the data. Table V-6 shows a decrease of 582.19 square feet for square loaded items. The actual effect of planned items would be determined only after entering into the MAGTF data base the exchange of TAMs for each affected T/E. This procedure, however, is included in the weight and cube control program presented in Section VIII.

However, considerable data was found to be available supporting an analysis of introducing a new family of shelters into T/Es of many units in the notional MAF. A task was conducted that caused the data for the new shelters to be entered into the MAGTF data base, along with the elimination of replaced TAM items. With completion of these efforts, a separate run of the MAGTF Program was obtained, which provided the necessary information to determine the difference in lift requirements of the MAF with and without the new shelters. Table V-7 presents these results. Examining this data reveals that an insignificant percentage increase in measurement tons of bulk cargo, and an approximately 1 percent increase of square feet of square loaded items resulted from the new family of shelters, which added 13,900 square feet of shelter space to the affected units.

Table V-5

COMPARISON OF PLANNED TAM ITEMS WITH REPLACEMENT TAMS
FOR BULK LOADED ITEMS

Replacement TAMs		P TAMs	
TAM No.	Cubic Feet	TAM No.	Cubic Feet
A0120	3	A0122	1.60
A0490	2	A0493	0.20
A0893	1	A0645	0.17
A1180	1	A1195	1.55
A1190	4		
A1420	11	A1415	5.65
A1435	552	A1436	545.8
A1460	2165		
A1505	89	A1500	627.7
A1507	89		
A1480	82	A1503	4131.0
A1800	1	A1815	12.25
A2020	8	A2065	2.81
A2380	3	A2505	1.66
A2490	6		
A3000	1	A1225	1.53
A3060	10	A3062	1.14
B0270	33	B0325	0.30
Total	3061		5333.36
Difference	2272.36		

Table V-6

COMPARISON OF PLANNED TAM ITEMS WITH REPLACEMENT TAMS
FOR SQUARE LOADED ITEMS

Replacement TAMs		P TAMs	
TAM No.	Square Feet	TAM No.	Square Feet
A1350	44	A1360	176.19
A1900	70	A1935	59.0
A1940	59		
A2080	10	A1795	4.15
A2440	208	A2441	88.8
B0400	141	B0399	495.0
B0410	126		
B1020	34	B1021	21.75
B1900	402	B1925	348.0
B2460	184		
D0900	118	D0915	122.22
D1000	132		
E0605	383	E0692	383.02
E0690	258		
E1360	398	E1377	304.68
Total	2576		1993.81
Difference	582.19		

Table V-7

COMPARISON OF CUBE AND SQUARE OF EXISTING SHELTER SYSTEM WITH REPLACEMENT SHELTER SYSTEM

	Existing Shelters (sq ft)	Replacement Shelters (sq ft)	Increase (sq ft)	Percent of Increase	Replacement* Shelters (cu ft)
AE	32,100	40,600	8,500	26.5%	1,900
AFOE	18,700	24,100	5,400	28.9	600
MAF	50,800	64,700	13,900	27.4	2,500

*Shelters in existing system are square loaded and do not affect cube. The added cube shown is for the knockdown shelter, which is the only replacement shelter not square loaded.

Section VIII of this report presents a detailed discussion of the use of the MAGTF System to support the data for a materiel weight and cube control program. The shelter MAF MAGTF run is explained in more detail in that section. The methodology presented in Section VIII provides procedures to constantly monitor the direction amphibious lift requirements are taking from the proposed introduction of new materiel into T/Es of FMF units.

3. The New Combat Service Support Organizational Structure

The most important development occurring during the conduct of this study was the implementation of the new CSS organizational structure within the FMF. The data necessary to modify the notional MAF troop list with the new organization became available in automated form during November 1975. The TMR had the T/Os available earlier, but the availability of T/Es did not occur until the end of November 1975. The project was extended one month to provide the additional time to update the MAGTF data base in order to process the new CSS units through the analysis system of this study. The CSS notional MAF totals were presented in Section IV. Table IV-6 showed a reduction in lift requirements for the AE of the CSS MAF. This section presents a comparative analysis of the notional MAF with the CSS modified MAF. Table V-8(a) contains the AE of the CSS MAF, with the AFOE in Table V-8(b).

The effect of the newly structured MAF is illustrated in Table V-9, where totals for the AE and AFOE are compared for the notional and CSS notional MAFs. For the AE, a 6.4 percent reduction in bulk cargo, and a 9.6 percent reduction in square feet was achieved by restructuring the CSS units concerned. In the AFOE, a 79 percent increase in bulk cargo and a 1.5 percent decrease in square feet was observed. For the total MAF, a 41.3 percent increase in bulk cargo, and a 6.1 percent decrease in square loaded cargo was obtained. It should be

Table V-8(a)

CSS NOTIONAL MAF ASSAULT ECHELON LIFT REQUIREMENT

Unit	Quantity*	MT†	Square†	Barrels†	PAS
M4623M	1	1758	328	824	161
M1096	3	186	4663	491	184
M1038	9	1014	4427	453	1230
M1128	3	1678	23016	1170	707
M4233	4	906	6531	453	110
M1423	4	437	69	19	85
M1373X	4	71	1096	75	121
M4652	4	110	15292	1491	229
M1863X	1	99	1961	113	182
M1864X	1	345	12631	755	244
M1862X	1	136	23312	1038	223
M0701F	1	6482	2701	66	914
M4643F	1	667	5788	264	57
M1196	1	969	17364	1208	278
M1363X	1	2313	31214	1830	202
M4237	1	847	16832	774	313
M4233	4	906	6531	453	110
M4903	3	35	605	38	120
M4907	1	96	6296	358	182
M3857X	1	398	10957	1245	287
M3853X	4	59	1901	113	103
M1427	1	115	6470	283	130
M8625X	1	172	3640	208	278
M1988	1	847	10486	925	1225
M1377X	1	118	788	94	131
M1867X	1	159	6562	340	173
M4654	1	226	11536	943	253
CMD-GP	1	1932	85992	3931	1984
M8612X	1	386	16526	1283	388
M8631X	1	1005	13757	2302	244
M8640X	1	322	7935	943	197
M8621X	1	115	4831	491	115
M8615X	1	196	2870	301	158
M8937X	5	1217	3164	1811	241
M8943X	3	1291	3896	3057	298
M8970X	1	1150	2670	1189	292
M8964X	2	1109	2767	1245	269
M8968X	1	1305	3848	1472	217
M8859X	1	2001	5421	8642	363
M4112	1	664	14469	736	225
M0601F	1	35	0	0	212
M0604F	1	668	11024	906	257
M4193	2	417	10497	528	177
M4201	1	67	2019	170	120
M4226	1	677	8661	528	177
M3223X	1	571	11275	491	280
M3233F	1	43	1455	57	125
M3447F	1	113	5832	358	337
M3343F	1	10	427	19	136
M3247F	1	127	1975	38	55
M3313F	1	2954	22677	0	140
M3323F	1	8	458	19	47
M3442F	1	1111	11201	472	202
M3243X	1	814	7131	189	191
M3253X	1	210	2741	75	190
M3851X	1	631	10957	1245	287
M0305F	1	212	11914	736	120
M0307F	1	24	571	38	82
M3751X	1	2220	7847	755	315
M3753X	2	801	8884	434	144
M8914X	2	180	4801	189	359
M8921	2	3238	17237	1283	390
M1985X	1	62	12516	415	143
M8821	2	87	2181	208	73

*Amounts listed are for one (1) unit; multiply by Quantity for total lift requirement.

†MT = 77624 Sq = 786926 Bl = 82848
Computed totals have been adjusted by removal of obsolete TAMs.

Table V-8(b)

CSS NOTIONAL MAF ASSAULT FOLLOW ON LIFT REQUIREMENT

Unit	Quantity*	MT†	Square†	Barrels†	PAS
M4722	1	17	919	200	16
M4392	1	114	2550	800	53
M0602F	1	30	0	0	66
M0605F	1	153	3086	500	77
M8820X	3	2828	9188	6800	333
M8620X	1	766	21116	7900	325
M8621X	2	189	4902	2700	115
M8710X	1	1892	12123	9500	515
M8715X	1	31075	85424	13900	503
M8714X	1	34099	44688	11600	377
M3751X1	1	2275	7919	4100	315
M3752X	1	1919	25159	1200	139
M3851X	3	301	1564	900	71
M4903	1	107	610	300	120
M4644X	1	17847	60770	5700	238
M4647X	1	1398	10083	2600	156
M3853X	1	110	1916	600	103
M3854X	1	191	2067	700	239
M3753X	1	3798	8955	2400	144
M3233N	1	978	10233	1100	158
M3757N	1	403	841	314700	82
M3755N	1	12723	32739	1035100	115
M4643N	1	16439	37103	8700	264
M3247N	1	2857	15185	6400	152
M3313N	1	427	46763	900	405
M3323N	1	1285	1285	400	142
M3343N	1	948	3827	900	268
M3447N	1	1037	12246	6600	255
M3442N	1	1733	9196	3800	388
M3444N	1	237	1571	600	179
M3445N	1	158	756	400	268
M3347X	1	584	7914	3300	379
M3443X	1	510	4932	1700	375
M0702	1	4893	53658	0	763
M0603F	1	13	0	0	4
M8712	1	62	831	200	49
M8652	1	674	11244	62500	122
M8780X	1	1368	3975	63400	419
M8813X	3	444	3923	1300	449
M8855	2	6185	7680	26500	227
M8857X	2	5443	7436	38200	347
M8848X	4	2884	5116	65000	377

*Amounts listed are for one (1) unit; multiply by Quantity for total lift requirement.

†MT = 189009 Sq = 648209 Bl = 2022400
Computed totals have been adjusted by removal of obsolete TAMs.

Table V-9

NOTIONAL AND CSS MAF COMPARISON

	MT	Square
Assault Echelon		
Notional	82,906	870,856
CSS Notional	77,624	786,926
Difference	5,282	83,930
Percent of difference	6.37%	9.64%
Assault Follow-on Echelon		
Notional	105,749	658,076
CSS Notional	189,009	648,209
Difference	84,000	9,867
Percent of difference	79.43%	1.50%
Total MAF		
Notional	188,655	1,528,932
CSS Notional	266,633	1,435,135
Difference	77,978	93,797
Percent of difference	41.33%	6.13%

remembered that these figures represent ship loading requirements and do not include aircraft, boats, or bulk fuel. The significant reduction, of course, is in the AE, where the constrained assault shipping capacity exists. Section VII will include common user sealift assets required to lift the AFOE. There were no constraints identified for lifting the AFOE of the MAF, and no further work was done on the loading of the AFOE.

Because of the increase in bulk cargo of the CSS AFOE, a comparison of the AFOE by functional area was conducted to illustrate from which units the increase was derived. Units were compared by following functional areas:

(1) Aviation

(2) Motor transport

(3) Medical/dental

(4) Engineer, bulk fuel, bridge support

(5) FSSG/FSR units

(6) Aviation fly-in units.

Table V-10 contains the unit comparisons within the functional areas listed above. The information in the table clearly indicates where the cargo increases were obtained. Since each MAF is only notional, and a great many variations in troop lists are possible when preparing a force structure for a specific mission, the comparison presented here is not of too much importance. The complete reorganization of the CSS functions within units does not lend itself to a unit-by-unit comparison with the structure from which it was derived. Observing the troop list provided, one sees many detachments which could and would be organized differently than shown here when preparing for specific missions.

At the direction of the Study Advisory Committee, the CSS structure presented here was the basis of all analysis to be presented. No further mention of the notional MAF will be made in this report.

Table V-10

AFOE UNIT FUNCTION COMPARISONS

	Notional MAF				CSS Notional MAF			
	Unit	Quantity	MT	Square	Unit	Quantity	MT	Square
Aviation Function	M8820	3	14,136	58,317	M8820X	3	8,484	27,564
	M8620	1	3,204	23,664	M8620X	1	766	21,116
	M8710	1	2,998	18,589	M8710X	1	1,892	14,123
	M8621	2	1,162	14,026	M8621X	2	378	9,804
	M8715	1	15,065	32,696	M8715X	1	31,075	85,424
					M8714X	1	34,099	44,688
	Total		36,565	147,292			76,694	202,719
	Difference		MT =	40,129	Sq =	55,427		
Motor Transport Function	M4643	3	828	30,996	M4643N	1	16,439	37,103
	M4644	1	437	20 885	M4644X	1	17,847	60,770
	M4647	1	184	3,925	M4647X	1	1,398	10,083
	Total		1,449	55,806			35,684	107,956
	Difference		MT =	34,235	Sq =	52,150		
Medical/Dental Function	M4552	4	532	7,256	M3851X	3	903	4,692
	M4512	1	204	2,677	M3853X	1	110	1,916
	M4592	1	266	3,897	M3854X	1	191	2,067
	Total		1,002	13,830			1,204	8,675
	Difference		MT =	202	Sq =	5,155		
Engineer/Bulk Fuel/ Bridge Functions	M3333P	1	2,422	7,875	M3751X	1	2,275	7,919
	M4343	1	7,056	32,597	M3752X	1	1,919	25,159
	M0306F	1	441	12,763	M3755N	1	12,723	32,739
	M0308F	1	1,470	11,707	M3757N	1	403	841
	M4353	2	732	17,090	M3753X	1	3,798	8,955
	Total		12,121	82,032			21,118	75,613
	Difference		MT =	8,997	Sq =	6,419		
FSSG/FSR/CSS Functions	M3213	[illegible]	102	1,695	M3233N	1	978	10,233
	M0313F	1	272	5,985	M3247N	1	2,857	15,185
	M0315F	1	271	16,381	M3313N	1	427	46,763
	M0323F	1	314	46,219	M3323N	1	1,285	1,285
	M0325F	1	1,767	2,569	M3343N	1	948	3,827
	M0327F	1	389	2,817	M3347X	1	584	7,914
	M3346	1	217	9,386	M3443X	1	510	4,932
	M3403	1	193	2,755	M3447N	1	1,037	12,246
	M3413	1	991	66,372	M3442N	1	1,733	9,196
	M0333F	1	2,466	10,136	M3444N	1	237	1,571
	M3443	1	251	4,531	M3445N	1	158	756
	M3447	1	4,695	21,624				
	M0304F	1	8	168				
	M0302F	1	16	107				
	Total		11,952	190,745			10,754	113,908
	Difference		MT =	1,198	Sq =	76,837		
Fly-In Function	M8780	1	1,650	7,642	M8780X	1	1,368	3,975
	M8813	3	2,472	26,097	M8813X	3	1,332	11,769
	M8857	2	10,538	18,834	M8857X	2	10,886	14,872
	M8849	4	9,572	27,540	M8848X	4	11,536	20,464
	Total		24,232	80,113			25,122	51,080
	Difference		MT =	890	Sq =	29,033		
All Functions	AVN		36,565	147,292	AVN		76,694	202,719
	MT		1,449	55,806	MT		35,684	107,956
	Med/Dent		1,002	13,830	Med/Dent		1,204	8,675
	Engr/Bulk/Br		12,121	82 032	Engr/Bulk/Br		21,118	75,613
	FSSG/FSR/CSS		11,952	190,745	FSSG/FSR/CSS		10,754	113,908
	Fly-In		24,232	80,113	Fly-In		25,122	51,080
	Total		87,321	569,818			170,576	559,951
	Difference		MT =	83,255	Sq =	10,597		
	Unchanged Units		18,433	88,258	Unchanged Units		18,433	88,258
	Comparison Units		87,321	569,818	Comparison Units		170,576	559,951
	Total		105,754	658,076			189,009	648,209
	Difference		MT =	83,255	Sq =	9,867		

D. Analysis of Mountout/Prepositioned War Reserve Materiel (PWRM)

The final area of materiel adjustment having impact on the MAF lift cargo requirement is the mountout specified by the MAGTF data base automated service files. The IDF maintained by HQMC contains the CARF, which is the basis for computing supply classes IIW and VIIW. During 1972 a review of CARFs was conducted at HQMC (Code A04) to determine those items whose CARFs could best be eliminated from the IDF in order to reduce the cost of replenishing mountout at the end of the Vietnam conflict. The elimination and reduction of the CARF for many TAMs was not made as a result of any user demand history. Because of the changes in the CARFs to the values currently in the TAM, a strong suggestion is self-evident that the mountout now held by the FMF may be inadequate for any future conflict. A comparison of the items having CARFs in the TAM published before 1972 with the current TAM is made in Table V-11.

Table V-11

PERCENTAGE OF TAM ITEMS (TYPE 1) HAVING CARFS

TAM Date	TAMs* with CARFs	Total* TAMs	Percent with CARFs
1968	891	1315	68
1974	218	1088	20

*Does not include obsolete or reassigned TAMs.

Only 20 percent of the items have CARFs in the current TAM as compared with 68 percent in the 1968 TAM.

Because of the possibility of the current mountout failing to adequately support a deployed MAF, a research task was undertaken within the study to obtain a more realistic approach to computing mountout. If an increase in mountout occurs, a definite impact on the lift of the AE will result. Obtaining an estimate of the increased lift was the result desired from this materiel adjustment problem.

To properly plan, store, warehouse, and load supplies and equipment in mounting an amphibious mission, it is necessary to know expected consumption rates of end items. It is also necessary to know average unavailabilities (NORS rates).

Actual consumption rates will vary from nominal figures, even if the nominal figures are reasonably accurate averages over several scenarios, geographical locations, and weather conditions. Variation will occur because of chance events, unpredictable losses, repair service problems, possibility of substitution, etc.

Although replacement factors are shown in the literature, these factors may not be adequate for use in planning an amphibious operation. Close analysis of the application of these and similar replacement figures was therefore undertaken. There are several possible sources of information. These are reviewed below.

1. Previous Studies of Consumption Rates of End Items

In 1966 a U.S. Army study[5] of consumption rates of end items was directed towards computing the budget required to support an Army operation under any one of 15-20 scenarios at various parts of the globe. The scenarios included conventional warfare in several intensities. This particular Army study is important in computing variation in planning factors from one theater of operations to another. It does not

seem to be directly useful in addressing the problem at hand: expected consumption of class VII end items.

A second report[6], as well as the data used in compiling it, was made available to the study team. Analysis of the data is included later in the present document. Although this report was intended to pinpoint fiscal requirements, the subject matter seemed at first to cover recoverable consumption data. Unfortunately, this data turned out not to be as useful as hoped.

A third previous study[7] tabulates and totals the shipments that passed through various Vietnam ports in the period 1966-1968. Combat strengths and combat active days in several logistic islands are also tabulated.

The important figure from this study is that consumption of class VII items by Marine Corps personnel averaged 5.18 pounds per man-day of active combat. The corresponding figure for class II items is 7.83. This number varied over the logistic islands, being much higher in the Saigon zone, and somewhat lower in the Cam Ranh Bay and other logistic zones. Further discussion and application of this figure is given later in the present report.

2. Application of Consumption Rates to Planning

a. General Remarks

Even if a consumption rate were known with unassailable accuracy, it is not immediately clear how the rate should be used in planning an amphibious operation.

"Consumption rate" by itself usually denotes an average or expected rate; this rate can vary from day to day, and is, in the nature of things, a parameter that describes a stochastic (variable)

process. Random wear, unpredictable combat losses, incomplete maintenance, and unavailability of repair parts will all affect the complement or T/E that is operational during a combat exercise.

Because actual consumption is, in the nature of things, a variable rather than a fixed quantity, the strategy that will most efficiently guarantee combat readiness of a deployed unit is known to be a complicated one.

b. Conventional Restocking Procedure

Conventional restocking and redeployment of end items dictates that replacement units be supplied at constant rates, these rates being equal to the wear rates of the end items. This strategy is an inefficient one for several reasons. In the first place, it assumes that all end items have equal criticality; this assumption is open to question. In the second place, it assumes that all end items will require replacement at precisely predictable times, which is not the case. And in the third place, there is no provision, under this stocking policy, for replacement of those items for which the safety stock in the objective zone is exhausted. At least, there is no provision other than emergency resupply. But emergency resupply is known to be rather expensive in terms of personnel effort and of shipping space.

c. Improved Stocking Procedure

As soon as it is realized that actual consumption will vary above or below the "expected consumption" of each end item, a more efficient stocking, shipping, and supply policy can be devised.

The first step, however, must be a reasonably useful knowledge of consumption (demand) rates. The CARF (combat active

replacement factor) listed in the present TAM is zero for a large number of end items, and no criticality is listed.

The absence of a criticality factor is not surprising, since the criticality of any piece of equipment does depend on the function assigned to the military unit that is consuming the equipment. The statement that the CARF is zero is more questionable. The CARF may vary from military unit to military unit, but it is seldom zero.

3. Analysis of Data From HQ FMFPAC

a. Description of Data

The data in the HQ FMFPAC report[6] consists of computer tapes, together with supporting documents. The computer tapes contain records of 900,000 requisitions that were processed at FSR and FLC during the period 1968-1970.

Each record shows FSN, requesting military unit, quantity requested, date (month) and unit price. The supporting documents show the nature of the requesting military unit (defined in the computer tape by a numerical code); these documents also show the combat status of the military unit.

The TAM number is not shown, nor is the square, cube, weight, NML indicator, square load indicator, or quantity in T/E.

Fortunately, the missing data could be supplied from the MAGTF data base. On the other hand, this data base does not show unit price. Since the unit price is now available, and can be used for certain other routine statistical analysis and correlations, it is suggested that the unit price be incorporated into the MAGTF data base as a permanent field in the EQUIP record.

b. Attempt to Extract Consumption Rates

The first step in the analysis was to extract those requisition records that pertain to the TAMs of interest. This extraction was carried out by the use of an FSN-TAM conversion code prepared for a previous project. It turned out that several FSNs correspond to the same TAM; even more surprising, more than one TAM corresponded to the same FSN in some cases.

The next step was to organize the data according to the T/E of each of several military units. The military unit code in the HQ FMFPAC tapes differed from the military unit code used in authorized Marine Corps documents. The conversion key was furnished by SRI, based on knowledge of Vietnam troop organization.

The last step was to take out demand and divide the demand by the quantity in the T/E. All this information had to be merged with another file that contained square, weight, cube, etc., (EQUIP File). The ratio of crude demand to quantity in the T/E, TAM by TAM, was called normalized demand, or specific demand.

It had been hoped that there would be some correlation between this demand rate and unit price. No such meaningful correlation was found, in spite of heroic attempts. (Such a correlation is known to exist under other field conditions.) The absence of correlation in the present data can be explained in several ways: demand was a function of what was available rather than what was actually needed; demand data records were grossly incomplete.

Both these explanations are reasonable, and, to a certain extent, both of them are true. On the last point, the supporting documents specifically mention the fact that many requisitions have been lost and are unrecoverable. On the first point, although demand rates were by no means flat over all items, they did not vary much.

In any case, the best information that can be gleaned from the HQ FMFPAC data is that the expected demand rate for an A TAM is to be estimated by taking an average figure; the table following shows the final conclusion of the data manipulation that was performed. (Caution: since the data is incomplete, the tabulated numbers are low. The magnitude of the error is discussed later in this report.)

Table V-12

DEMAND RATES FOR CLASS VII SQUARE LOADED ITEMS
(Average Figures 24-Month Replacement Factors)

No. of TAMs Averaged	TAM Category	Demand (24-month)	Average Unit Cube	Average Unit Price
107	A	.07066	43.82	3226.07
37	B	.07357	87.20	1790.45
402	C	.06123	5.26	144.30
102	D	.06130	171.23	1429.35
93	E	.05173	16.41	1184.90
741 (total)				
Mean		.0620	39.17	959.54

Note: Items included are only those (1) for which information could be obtained, and (2) that are included in the T/E of the three military units M1988, M1038, M4112. (Other TAMs are not included in these average figures.) Additional details concerning the analysis are given in Appendix H.

4. Computation of Mountout Adjusting Factors

a. Analysis of the PRC Study

1. The Raw Consumption Rate. As stated above, the PRC[7] study indicates a consumption rate of 5.18 pounds of class VII items, i.e., 4.17 for square loaded and 0.10 for nonsquare, and 7.83 pounds of class II items per man-day of combat in the Vietnam conflict, 1966-1968. This figure was obtained from on-the-spot analysis teams; these teams had access to shipping information and were thus able to include all supplies that passed through the ports. Internal checks of the data, comparisons with performance of truck companies that off-hauled equipment, and variation from one logistic island to another show that the information is self-consistent.

2. Reduction of the Raw Consumption Rate. To reduce the data to the form needed for planning purposes, it is necessary to know the T/E being supported. This is the weak point in the present analysis; the actual T/E deployed in the field at that time cannot be determined. It was probably somewhat larger than current T/Es.

Another judgmental adjustment has to do with the relation between quantities shipped and quantities consumed. The amount shipped, or even the amount received, is not necessarily equal to the quantity consumed. In fact, it is known that large surpluses remained at the end of the Vietnam conflict. However, if these surpluses were only a fraction of the total shipped per year, the adjustment that is required to take account of the remaining surplus may not be overwhelming.

The figures 4.17, 7.93 pounds/man/day were reduced to pounds/man-day demand figures for TAM items in the following fashion. First the total weight of all class VIIW square loaded items and class IIW and VIIW

nonsquare contained in mountout computed by the MAGTF System for the CSS notional MAF were computed. Next, the total personnel strength was used to compute the number of combat man-days in a 15-day period as specified for the AE. Dividing the total weight of demand as computed for 15 DOS, and the 4.17, 7.93 values by the weight of mountout currently computed, resulted in an adjustment factor, as shown in Table V-13, of 39. This means that the mountout computed from the current values of the CARF and the float is 39 times too low when compared with the Vietnam usage data contained in the relevant study[7]. The total weight used to obtain this factor includes the operational readiness float for the same supply classes.

Table V-13

MOUNTOUT ADJUSTING FACTOR CALCULATION: VIETNAM DATA
(Classes IIW, VIIW Nonsquare)

Data Source	Mountout Weight
MAGTF	46,099*
Float	106,943
Total	153,042
Vietnam	4,201,790†
Adjusting Factor	39

*Data obtained from notional MAF: MAGTF summary.

†Value obtained from:
$Wt = 7.93 \times 35,324 \times 15$
7.93 = lb/man/day
35,324 = personnel strength AE
15 = DOS for AE.

The figure used for the float was one-third the total for the entire MAF. For supply class VII square, again including the float, the factor is 1.09, as shown in Table V-14. The sizeable float embarked, when included in these calculations, reduces the factor from 1.4. The float was included since both mountout and the float are available to supply the total demand and should be included in the comparison with total Vietnam demand.

Table V-14

MOUNTOUT ADJUSTING FACTOR CALCULATION: VIETNAM DATA
(Class VIIW Mountout)

Data Source	Mountout Weight
MAGTF	1,564,384*
Float	465,387
Total	2,029,771
Vietnam	2,209,516†
Adjusting Factor	1.09

*Data obtained from notional MAF: MAGTF summary.

†Value obtained from:
$Wt = 4.17 \times 35,324^{*} \times 15$
4.17 = lb/man/day
35,324* = personnel strength AE
15 = DOS for AE

The adjusting factors computed here were used to determine their effect on the AE lift problem when loading in a constrained assault shipping environment. Results from this analysis are presented in Section VII.

b. <u>Middle East War Adjustments</u>

The consumption data used here to evaluate the adequacy of the current mountout computations, of course, was based on the Vietnam conflict. Usage rates observed from the Middle East war might have added additional insight to the shipping requirement needed to lift the square loaded mountout cargo category--if such data had been available. General information concerning that conflict suggests that high loss rates may be expected in the class VIIW square category when a combat force engages predominant mechanized forces. An arbitrary adjusting factor will be used in Section VII to indicate the additional mountout lift requirement needed to support much higher loss rates.

c. <u>Adjustments From the 1968 TAM</u>

After examining the difference in the number of TAM items having CARFs between the TAMs of 1968 and 1974 previously presented, it was also necessary to compute an estimate of the effect of using the 1968 TAM CARFs to compute mountout on AE lift requirements. It was originally planned to enter the 1968 CARF values into a special MAGTF data base version, and rerun the MAF. This method was not possible due to excessive costs and the lack of opportunity to process this run on the NPGS computer. It was decided that the accuracy obtainable from using an approximation method was sufficient to demonstrate the effect on amphibious lift. The procedure used was to select a small sample of units found in the AE and compute an adjusting factor derived from the difference in the weight of mountout between the 1968 and 1974 TAM CARF values. A value of 2.38 for an adjusting factor was obtained. Table V-15 contains the units and values from which the adjusting factor was derived.

In summarizing the PWRM analysis conduced during this study, the original intent was to compute recommended values for the CARF from combat usage data. Although this task was accomplished, the observed problems with the data prevent the recommendation to use the computed CARFs for mountout calculations. This task establishes a requirement for further study of the mountout computational problem.

Table V-15

VALUES USED TO COMPUTE A CARF ADJUSTING FACTOR FROM THE 1968 TAM

Unit	1968 TAM	1974 TAM	Ratio
M8615	24,599	8,203	3.0
M1038	19,015	3,521	5.4
M4112	36,688	21,980	1.67
Total	80,302	33,704	2.38

The adjusting factors obtained from the Vietnam data contained in the PRC study, the adjusting factor computed from the 1968 TAM, and an arbitrarily selected adjusting factor for high combat loss rates reflecting Middle East war effects are used to emphasize the lift requirement generated from more realistically computed mountout.

E. Summary

This section has provided a description of the data and its sources to be used for conducting the analysis of the constrained amphibious lift problem. The MAGTF System data was presented, along with materiel adjustments that will have an effect on the complete lift requirement for a notional MAF. The next section will present a description of a computer assisted model that generates and uses the data presented herein.

F. Conclusions

As a result of the analysis presented in this section, the following conclusions were developed.

(1) The overall capability of the MAGTF System and the continuous requirement for lift data from all

categories of cargo available from this system justifies the expenditure of effort to conduct the further improvement of the MAGTF Program and continued updating of the MAGTF data base. (Page V-15.)

(2) The MAGTF System generated lift expression for the MAF is the most current and accurate source of this specialized data in existence. (Page V-2.)

(3) The known errors in the MAGTF System data cause an understatement of total lift requirement. (Page V-9.)

(4) The T/E reviews conducted by units in the FMF during this study did not identify an accumulation of significant quantities of nonessential equipment. (Page V-16.)

(5) The combat active replacement factor (CARF) used to compute PWRM for mountout and mountout augmentation is not currently based on realistic expected consumption rates for supply classes IIW and VIIW. (Page V-30.)

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VI THE CONSTRAINED AMPHIBIOUS LIFT ANALYSIS SYSTEM (CALAS)

A. General

In the previous two sections of this report, the nature and extent of the amphibious lift problem were presented. Briefly, the extent of the problem was defined by comparing the capacity of amphibious assault ships expected to be available during the period to 1980 with a realistic statement of lift requirement computed from a notional troop list for an assault echelon component of a MAF. The nature of the problem was derived from the four principal areas controlling cargo totals and the flexibility obtained from incrementally phasing the arrival of units ashore in the objective area. The data presented in the statement of amphibious lift short fall showed that only 61 percent of the bulk cargo and 9 percent of the square cargo could be loaded into the 59 ship force for the troop list comprising the AE of the notional MAF. The first two objectives for the study indicate the nature and extent of the lift problem by stating the requirement of determining the feasibility of reducing landing force materiel for embarked units, and by reducing lift requirements from phasing units ashore, when possible, from the AFOE embarked in nonassault shipping.

The approach pursued to solving the amphibious lift short fall problem within the descriptors contained in the study objectives was to analyze the problem from the four principal areas controlling cargo totals. As previously stated in Section IV, those areas are:

(1) Troop list of AE

(2) Selection of AE units for phasing ashore

(3) Days of supply for mountout

(4) T/E lift requirement.

A change in the number of amphibious ships will affect the problem (if feasible).

To find a solution to this difficult problem, a series of models was developed from very practical approaches. These models provide the means for analyzing each principal aspect of the problem as field commanders would be required to do, utilizing subjective judgment along with a systematic analytic technique designed within a series of computer programs. In effect, a solution procedure has been developed that functions as a computer assisted decision aid to the commander for solving the constrained amphibious lift problem within the context of an assigned mission. This section provides a description of the solution procedure, which has been called the Constrained Amphibious Lift Analysis System (CALAS). Each subsystem will be explained, along with the overall system functioning process. References will be made to appendices that contain technical descriptions of the mathematical models designed within the supporting computer programs comprising the system.

B. CALAS Description

Figure VI-1 contains a flow chart of CALAS, which will be repeatedly referred to in this section. Application of CALAS begins when the commander has been given a specific mission for which a troop list has been developed. The first step is to determine the lift requirement for the selected force. The number of days of supply for the AE and AFOE, and the configuration for loading fuel requirements must also be specified, along with any special materiel for the geographic location of the objective area. When these decisions are made, CALAS may then be employed.

CALAS consists of the four subsystems shown in Figure VI-1. A brief description of each subsystem is presented here.

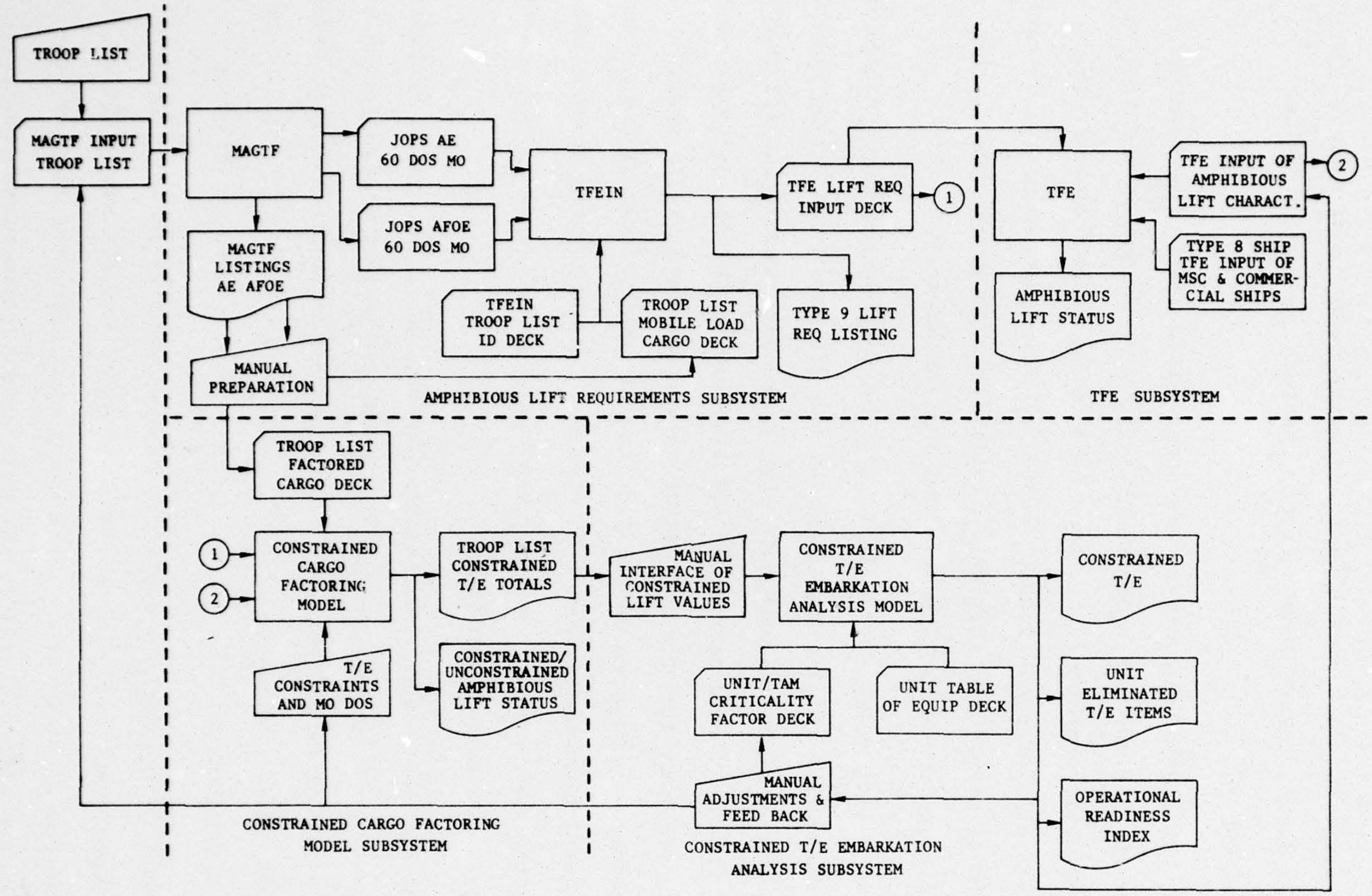

FIGURE VI-1

CONSTRAINED AMPHIBIOUS LIFT ANALYSIS SYSTEM (CALAS)

The amphibious lift requirements subsystem provides the amphibious lift requirements for the specified troop list from MAGTF and TFEIN programs. Automated data providing the precise cargo categories of personnel, bulk cargo, square loaded cargo, and bulk fuel are obtained from this subsystem.

The TFE subsystem receives the cargo data, called the movement requirement, for each unit of the AE, and, with the added input of the amphibious lift characteristic card deck of amphibious assault ships available, simulates the loading/unloading and movement to the objective area. In so doing, the lift short fall, i.e., cargo not loaded, is obtained along with the time required for the movement.

When a lift short fall does exist, the Constrained Cargo Factoring Model subsystem uses the same input as the TFE subsystem, along with the factored cargo deck for each unit, the constraint values for T/E reduction, and the DOS for the AE mountout, and systematically reduces cargo by specific category for the constraint values provided to the program. The output of this subsystem is the listings of constrained T/E totals and the constrained/unconstrained AE lift status. This subsystem applies the constraints and loads the ships, computing the lift status, i.e., lift short fall for each constraint.

The Constrained T/E Embarkation Analysis Model subsystem determines the T/E items to be included and excluded from the lift requirement based on the criticality factors assigned to each item of the T/E. An operational readiness index is computed for all constraints applied. This subsystem prints a constrained T/E and operational readiness index as output.

Based on the input troop list, days of supply, shipping available, and assigned constraint values, a shipping short fall may still exist in spite of the T/E reductions. For each constraint, the list of items selected for elimination from the unit load is also presented. With this

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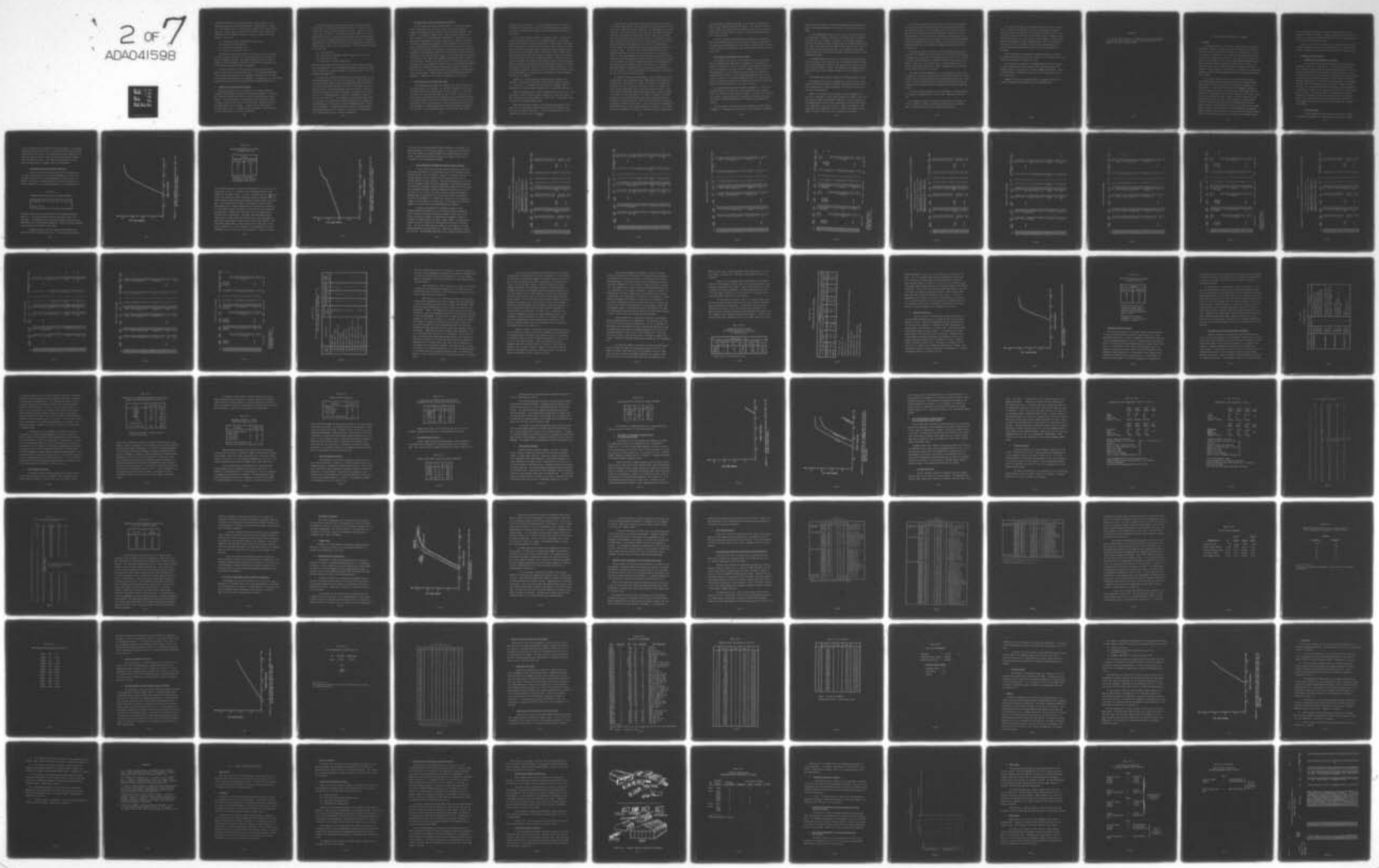

information available to the commander and his staff, analyses of the various options may now be made using CALAS. Referring again to Figure VI-1, the feedback lines in the flow chart represent the courses of action possible. Because there is a constraint value below which computed T/E reductions are unacceptable, alternative courses of action must be considered. These are to:

(1) Increase the number of amphibious assault ships

(2) Reduce the DOS for mountout

(3) Increase the constraint value

(4) Reduce the units in the troop list.

In addition to these major options, the criticality factors assigned to the T/E items of the unit may be varied according to the judgment of the unit commander concerned. By varying the options that are input to CALAS, the most operationally ready force possible may be determined within the overall constraints facing the commander.

The brief discussion of CALAS presented above should present the general concept of how the system functions. In the following paragraphs, a more detailed explanation of the subsystems is provided, with the technical presentations included in the appendices. An application of a constrained loading problem using the CSS notional MAF data constitutes Section VII.

C. Amphibious Lift Requirements Subsystem

Referring to Figure VI-1, an input deck for the MAGTF Program is prepared describing the AE and AFOE, as previously mentioned. Instructions for preparing the MAGTF input deck are found in the MAGTF System "Users' Manual." The MAGTF Program is then processed, which provides as output a complete listing of the units in the AE and AFOE. Appendix B contains two sample MAGTF AE unit listings. A summary for the AE and AFOE is available from the run. The MAGTF Program also punches a JOPS card file as an automated output for both the AE and AFOE.

The JOPS card deck then becomes the input to a computer program called TFEIN. An additional input deck consists of a troop list identification (ID) deck and a mobile loading cargo deck. There is one card in each deck for each unit. The purpose of Program TFEIN is to read the JOPS deck for each unit, combine the data from the ID and mobile loading decks, and punch a movement requirement card for each unit. The movement requirement card is formatted for input to the Transportation Feasibility Estimator Model[1] (TFE), to be explained later. The data elements contained on this card are:

(1) Total personnel

(2) Bulk cargo in measurement tons (40 cubic feet = 1 m. ton)

(3) Bulk fuel in barrels

(4) Square feet of square loaded items.

Additional data elements are included on this card for specific requirements of Program TFE. The data elements listed above also serve as input to the Constrained Cargo Factoring Model, facilitating a dual use of the movement requirement card.

The JOPS cards, having been designed for JCS specifications, are not directly representative of AE unit lift quantities. JOPS cards contain total cargo without regard to mobile loading, and mountout is fixed to the days of supply (DOS) specified for the MAF. The parameters used for computing lift of the notional MAF are listed in Section V. From that list, one observes that the DOS for mountout of the MAF are 60, and for the AE 15. It became necessary to include an algorithm to reduce the 60 DOS to 15 for AE units. The problems of converting the cargo totals to 15 DOS are more complicated than may be expected at first inspection. The development of the necessary conversion mathematical model is presented in Appendix D. Program TFEIN also produces a printed listing of the movement requirements for each unit in the force. An explanation of the TFEIN Program is also included in Appendix D.

D. Transportation Feasibility Estimator Model (TFE)

The TFE Program was obtained from HQ FMFPAC to provide an automated means of determining the lift status, given the principal inputs of movement requirements and the amphibious assault shipping capacity. TFE, however, is a simulation computer model that determines the gross movement feasibility of a projected plan of deployment. Specifically, given the movement requirement, the assault shipping, the capacity of the ports handling the loading and unloading, and the geographic locations of the ports of embarkation and debarkation, TFE will determine the time required to complete the movement of the materiel. Of the many listings provided by Program TFE, the significant output for this study was the cargo quantities not lifted by the ships provided as input. The ship input data was presented in Section IV. The format of the shipping data presented there conforms to the TFE Program. Because of the need to move the AE and AFOE from the port of embarkation to the amphibious objective area, with no turnaround shipping permitted, the extensive simulation capabilities provided by Program TFE were not needed. A loading simulation was then included in the Constrained Cargo Factoring Model. Sample outputs from the TFE Program are found in Appendix C. Amphibious lift status is contained in the TFE output.

E. Constrained Cargo Factoring Model (CCF)

After inspecting TFE output, the shipping short fall for the cargo of the notional MAF's AE is defined. The CCF model provides the next stage for CALAS, where the solution procedure begins to function. As evidenced in Figure VI-1, there are four inputs to the CCF Model. These are the same movement requirement deck and amphibious ship lift capacity deck used in the TFE Program, the troop list factored cargo deck, the values of DOS for mountout, and the constraints to be used for reducing the unit's T/E. The CCF model is a computer program that loads the movement requirements for each unit into the ships provided in an unconstrained mode, while

printing the lift short fall. It then constrains the amount of cargo to be loaded for each unit for a variety of constraint values, printing the troop list of constrained T/E totals and the constrained/unconstrained lift status.

The CCF model functions within the following scheme. The data provided to the model for each unit is in measurement tons (MT) for bulk cargo and square feet for square loaded cargo. Using the cargo factoring deck, these totals are factored into T/E totals, which include only supply classes IIW, VIIW (nonsquare) and IV; mountout of all nine supply classes, and class VIIW square loaded totals. For aviation units a further factoring is done for bulk cargo with respect to classes IIA and VIIA nonsquare, VIIA square loaded, and the IMA square loaded items. Now that the unit's cargo is factored into categories providing the logical areas for reduction, further constraints are then applied by multiplying the specific constraint by the T/E total for bulk cargo and by the T/E square loaded total. Since for classes IIA and VIIA, totals for units are defined to be initial issues, plus 90 days mountout, constraints are not applicable to these categories and they are not reduced.

Because of a decision made by the Study Advisory Committee, IMA equipment is eliminated by the model for loading into assault shipping, i.e., LPHs, LHAs. The assumption is made that this equipment will be furnished by the LPHs and LHAs, allowing it to be loaded into AFOE ships.

Mountout adjustments may be made by changing the DOS for the AE. Since the mountout cargo is factored and was computed for a specified number of DOS, reduction of the cargo quantity to 1 DOS is done. This amount is then converted to the desired number of DOS.

When all adjustments are made to the factored cargo quantities, new totals are then obtained by adding the factored parts together for both bulk cargo and square loaded cargo. The ship loading operation is then conducted and the next unit is processed.

The constraint values used for T/E reductions are given in decimals. A constraint value would be .90, indicating a 10 percent reduction in the T/E totals. Constraints were not applied to the same degree for all units of the AE. By the use of codes, constraints were not applied to detachments that were formed for performing a specific function. Constraint values used to reduce T/E cargo for combat units are assigned to be one-half the overall constraint for the AE. Combat support units generally were constrained by the same value as the overall constrained value. Certain combat service support units were constrained twice the overall reduction value. This variation in constrained values provides a weighted constraint for units in the AE according to their mission or function. The values assigned to the units in the notional MAF were arbitrary and could be changed by the user to satisfy his judgment in accepting the ultimate list of items eliminated from the T/E as determined by the constrained T/E embarkation model. The decision as to whether a detachment should be constrained can also be made at the discretion of the user of CALAS. A change in the code for the detachment will include the unit in the constraint calculations.

An additional feature of the CFF Model is the reallocation of square stowage space to bulk cargo when excess square space occurs through constraining the total square to be loaded. The nature of the cargo data indicated that such a feature was desirable because of a tradeoff that exists between eliminating some big item and loading more smaller items. Since there are many large square loaded items, such as trucks, included in AE cargo, and since the decision as to what to include or eliminate applies only to the period between D-Day and the arrival and specific unloading of the AFOE, options do exist as to which vehicles or engineer equipment to include in the AE units. Results obtained from analyzing the CSS notional AE cargo within CALAS, presented in Section VII, will demonstrate the usefulness of this feature. When excess square loaded space is

obtained during a constrained loading run, the space is reallocated to bulk cargo by assuming two-pallet high stacks. New totals for bulk and square loading are computed for the shipping capacity, and the units are reloaded for the same constraint value. A new value for shipping short fall is then obtained.

The output listings of the CFF Model are then used to provide the exact space reductions for the T/Es of each unit, which are then used by the Constrained T/E Embarkation Analysis Model to determine the most operationally ready mix of equipment for the reduced space allotted to the T/E of the unit.

F. Constrained T/E Embarkation Analysis Model

Each standard military unit in the Marine Corps has a prescribed Table of Equipment (T/E) detailing the equipment it is authorized to maintain. The ability of a unit to perform its function(s) is predicated on the availability of the major items of equipment listed in its T/E. The standard T/E of a unit assumes that there will be no shortage of shipping space in which to load the authorized equipment; but if there is such a shortage, two questions immediately arise: (1) Can the operation be successfully mounted? and (2) What part of the full strength T/Es should be carried by each unit in the assault echelon.

The problem addressed in the following paragraphs is: Given that shipping capability is limited by a fixed constraint (cube or square), what is the optimum T/E that should be loaded? It follows that when there is a volume or square constraint on shipping, the objective is to minimize the loss in efficiency caused by the decrease in equipment and supplies.

For the purposes of the Constrained T/E Embarkation Analysis Model (CONTEAM), it is assumed that for each unit a known amount of constrained

cube and square storage is given from the Constrained Cargo Factoring Model. The problem remaining is the optimal allocation of this scarce space.

For the CONTEAM model only the class IIW and class VIIW TAM items are constrained. However, a constraint can theoretically be applied to any other class(es) of supply, if desired. This procedure produces a concrete, pared down T/E that is smaller than the standard published T/E for a unit. The output from the CONTEAM model shows for each unit's T/E the class IIW and class VIIW TAM items to be omitted from the assault echelon; these will be carried by the assault follow-on echelon or later replenishment phase.

The CONTEAM model first fills the available space with a "skeleton T/E" consisting of those items that will be absolutely essential during the interval between the landing of the assault echelon and the arrival of the assault follow-on echelon. The balance of the shipping space is then filled with T/E items (TAMs) according to their importance to the unit.

The CONTEAM model operates within the following systematic design.

The importance of an item of equipment to a unit's mission can be derived by relating its usage to specific functions of the unit, and, in turn, determining the relative importance of the specific functions to the unit's combat mission.

Before a criticality can be assigned an item of equipment for a unit, it is necessary to relate each principal item (TAM) to one or more of 22 distinct functions performed by FMF units. For the purposes of the CONTEAM model, each T/E item is assigned a criticality that relates to its importance in the unit's mission. Within this framework, the model makes use of probability tables to compute the quantity of each TAM to be loaded to fill, but not to overflow the constraint.

For TAM items that occur in a unit's T/E with authorized quantities of 1 to 20, the program will include TAMs with the highest criticality and exclude TAMs with the next-to-highest criticality when the constraint amounts to 60-75 percent of the space required to load the unit's full authorized T/E. Of the TAMs with low criticality, the bulky ones will be selectively excluded, but usually in part. That is, the quantity admitted to the constrained T/E will be some fraction of the authorized quantity. Nonpriority TAM items will probably be completely excluded from the constrained T/E.

For items that appear in the unit's T/E with authorized quantities of 40-1200, the program will exclude some portion of the full T/E quantity in almost every case--even for the highest priority items. This is purely a function of the algorithm as it begins to favor the first units of low priority items over, say, the 100th unit of a higher priority item. Experience shows these results to be useful, although they can be modified if the planner feels this is necessary.

The output from the CONTEAM model is a constrained T/E, plus a list of quantities of each T/E item that must be left behind under the constraint (limited cube or square shipping space) assumed during the execution of the model. It must be emphasized that the CONTEAM model produces nothing but a tentative T/E that may need to be adjusted by the operational planning officer.

After the planner has made all of the adjustments he deems necessary, he can rerun the CONTEAM model to obtain a more desirable constrained T/E.

By assigning a weight (or importance) to each item of equipment of a unit, a measure or index of operational readiness can be calculated that is oriented toward the unit's operational function(s).

For a given T/E and unit, multiplying the quantity (density) of each item of equipment by its weight (criticality) and summing the products will give a value that indicates full or maximum readiness for that unit. If for some reason the T/E must be constrained by lack of shipping, availability of T/E items, etc, the items that can be shipped or that are available can be multiplied by their weighting factor, and, after summing the products, the value of readiness obtained can be compared against that value of readiness obtained from a 100% filled T/E and expressed as a percentage.

The OR index gives the capability of examining important tradeoffs. For example, the reallocation of square storage to bulk storage may actually increase the operational readiness of a unit.

It must be kept in mind that the CONTEAM model is but one subsystem of a much larger system and by itself does not necessarily provide the complete solution to the problem of limited shipping availability. Rather the CONTEAM model is designed to be utilized as an equal partner within the CALAS system.

Appendix F offers the interested reader the complete rationale and a detailed mathematical explanation behind the CONTEAM model.

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VII THE CONSTRAINED AMPHIBIOUS LIFT PROBLEM

A. General

The preceding sections of this report have provided the necessary background information to permit a detailed discussion of the solution procedure available from CALAS when applied to the amphibious lift problem created by comparing the CSS notional MAF lift expression and available amphibious assault ship capacities. This section will provide an analysis of the amphibious lift problem obtained by processing the input data previously described through the computer models of CALAS. The presentation will follow a logical procedure available to the staff planner in order to arrive at an optimal lift expression in a constrained amphibious assault shipping environment when utilizing the options available in CALAS.

The process of analyzing the CSS notional MAF data for the AE within CALAS demonstrates a systematic procedure for reducing landing force materiel within the constraints of operational readiness and sustainability. Additionally, the effects of incremental phasing of units and functions into the objective area from AFOE loaded ships are determined, which satisfies the first two objectives of the study. While the use of a notional MAF combat capability does not satisfy any real world combat mission, its troop list and resultant lift requirement provides a realistically sized problem for demonstrating the use of CALAS in aiding the staff planners of the MAF to include the most combat capable force for the assigned mission when embarked in the available assault shipping. Many iterations of processing the AE lift data through CALAS are possible while analyzing the effect of the different options

before selecting the commander's optimally combat ready force to be embarked in assault shipping. The greatest advantage from applying this method to the constrained loading problem is the rapid response available from a computer assisted decision aid.

Section IX will present a description of CALAS installed within an automated command and control system, demonstrating the concept of how the MAF commander and his staff may use the system in a routine manner.

B. Loading the CSS Notional MAF

1. Amphibious Lift Requirement Preparation

The AE troop list and cargo data used for the analysis were presented in Table IV-7 of Section IV. It may be recalled that this data prepared for ship loading was obtained by processing the troop list through the amphibious lift requirements subsystem of CALAS. For the staff planner, the troop list prepared for conducting the loading analysis was determined by analyzing the tactical problems to be solved from all available information. In the case of the notional MAF, it is assumed that the troop list contains all units desired for loading in assault shipping. By processing MAGTF and the JOPS cards, the lift requirement is computed for the AE. At the same time, the troop list factored cargo deck is punched. This deck is currently prepared by hand from data contained in the MAGTF listings, but when operating as an automated decision aid, CALAS would have this deck automatically written by the MAGTF program and available as input to the CCF model with no manual intervention.

2. The TFE Subsystem

The TFE program may be run at this point with the movement requirement and amphibious lift characteristic input decks. Sample

output listings from this program are found in Appendix C. This program primarily provides arrival times in the objective area, which are not a problem area in this study. This program does provide listings of unit cargo not loaded, as well as lists of ships sailing partially loaded, when that condition occurs. This program is most useful for cases where shipping capacity is greater than lift requirements.

3. Constrained Cargo Factoring Model Subsystem

With the same two input decks used by the TFE Program, the CCF computer model may be run for as many different values of the T/E constraint as desired up to some preestablished limit built into the program. Currently, the program executes for seven constraints, as shown in Table VII-1 for one program execution. After execution, the

Table VII-1

CONSTRAINT VALUES AND DOS FOR CCF MODEL PROCESSING

Constraints	1.0, .90, .85, .80, .75, .70, .65
DOS for AE = 15	

CCF Model output provides the staff planner the information shown in Table VII-2. The first constraint used by the model is 100, or no constraint. The amphibious lift short fall presented in Section IV was obtained from this unconstrained loading run. Results for each constraint value used are also included in this table.

A graph of percent short fall versus the constraints used within the model is shown in Figure VII-1. The curve shows the effect

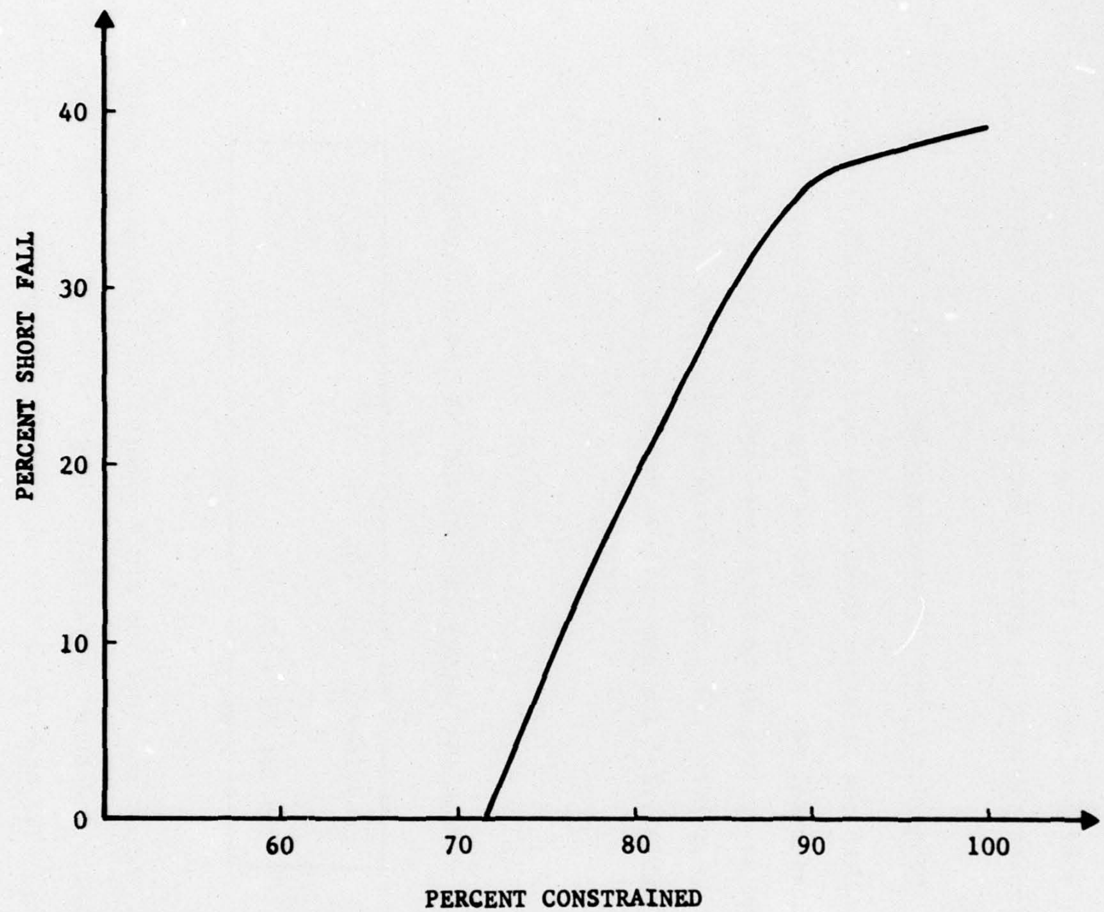

FIGURE VII-1. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR THE AE USING ASSIGNED PARAMETERS

Table VII-2

WEIGHTED CONSTRAINED UNIT LOADING
VS PERCENT SHORT FALL

Percent	
Short Fall	Constraint*
39%	100%
36	90
29	85
19	80
9	75
0	70.8

*Constraints are weighted according to units' missions, as explained in Section VI.

of increasing the amount of materiel eliminated from T/Es of units on the percent short fall, i.e., percent of the constrained cargo not being loaded into the assault ships. The curve illustrates well the interactive effect when constraints reduce the square loading requirements below the square capacity, permitting the reallocation of square space to bulk storage. If constraints were limited to being applied to square loading requirements until no square loading short fall occurred, the reduction in bulk loading necessary to reduce the short fall for bulk items would be prohibitive. Square loaded cargo space is fully loaded when constraining units by 88 percent. Therefore, when constraining square loaded items by values lower than 88 percent and in the same amount as bulk cargo, excess square loading space will exist and increase so that reallocating square space to bulk accounts for the steep slope of the curve in Figure VII-1. Total loading of the constrained AE at a more reasonable value of 70.8 percent is then possible. Figure VII-2 shows

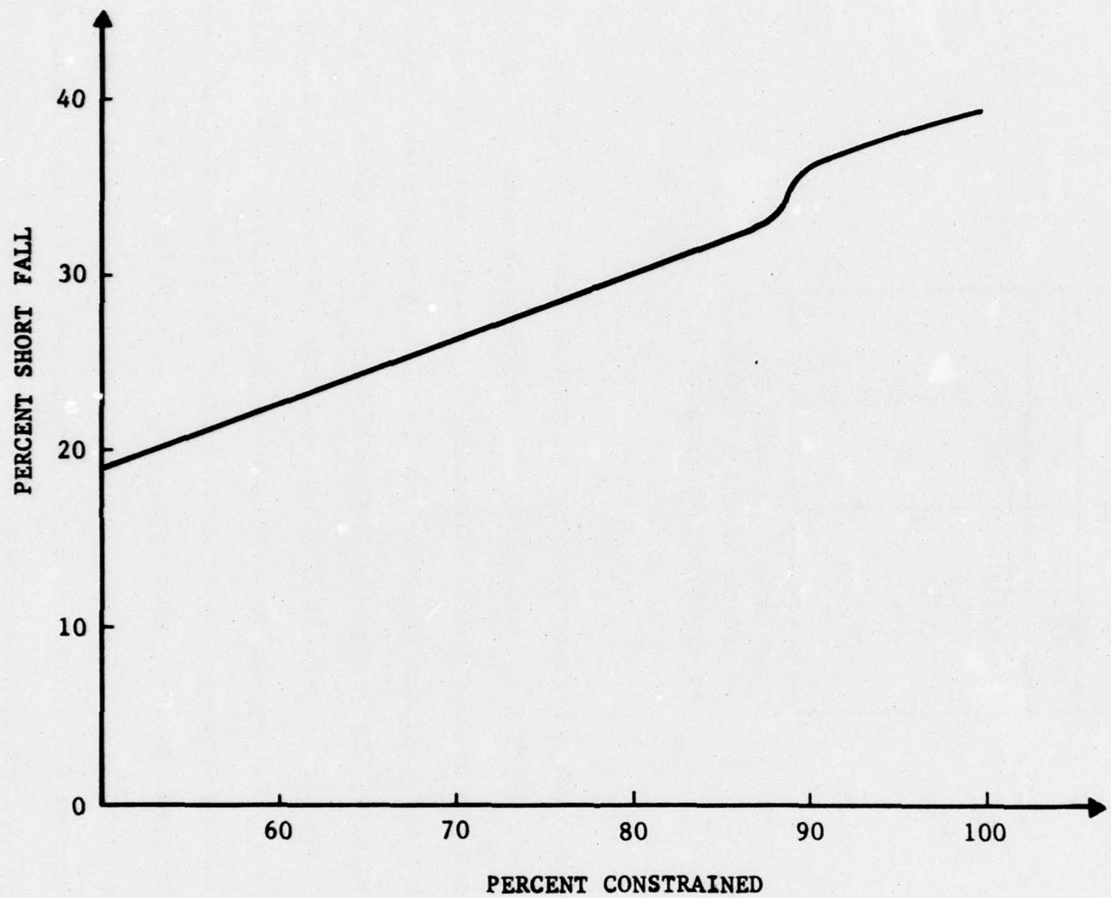

FIGURE VII-2. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR SQUARE LOADED CARGO CONSTRAINT FIXED AT 88 PERCENT

the effect of limiting the square loading constraint to 88 percent, the amount necessary to load all square space. In Figure VII-2, the lack of any further reduction of square loaded items below 88 percent is illustrated. Constraints as low as 50 percent still permit a short fall of 19 percent of the constrained bulk cargo.

4. The Constrained T/E Embarkation Analysis Model Subsystem

At this point the staff planner becomes interested in the T/E reductions calculated for units when applying the lower constraint values. He observes that, with no constraint, there is a 39 percent short fall in shipping capacity for the original troop list, and the short fall is further reduced for each constraint. Since the constraint value providing complete loading is lower than may be acceptable, other CALAS options will be considered in finding the optimal operationally ready force for loading into the assault shipping. Before considering other options, a study of the effect on unit T/Es for the lower constraint values is necessary to determine what T/E reduction level can be accepted while maintaining a viable unit's equipment list. Table VII-3 contains the T/E listings for a sample of unit, M1038, in the troop list. At this point the subjective judgment of officers doing the planning becomes all important.

Although the constrained T/E Embarkation Analysis Model (CONTEAM) operates systemically on the criticality factors assigned as input, returning the greatest operational readiness index value for the T/E mix included for loading, the experience and judgment of officers reviewing T/E reductions for all combat, combat support, or combat service support functions is required for determining the acceptable constraint level. The need for exercising such judgment is ever present in current peacetime amphibious training exercises. Making such judgments is therefore routine. The advantage gained from using a computer assisted decision

Table VII-3(a)

CONSTRAINED T/E FOR M1038 WHEN CONSTRAINED TO 90% OF AUTHORIZED T/E LIFT REQUIREMENT

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 95.0 PCT OR 15824.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 95.0 PCT OR 4209.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0005		5.0	159.0		5.0	159.0	1	8	1.		5.0	
A0090		3.0	47.0		39.0	611.0	13	8	13.		39.0	
A0265		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A0320		1.0	20.0		12.0	240.0	12	8	12.		12.0	
A0328		1.0	9.0		4.0	35.0	4	8	4.		4.0	
A0490		1.0	12.0		25.0	300.0	25	8	25.		25.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0922		1.0	3.0		15.0	45.0	15	8	15.		15.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		2.0	20.0	2	4	2.		2.0	
A1420		11.0	93.0		22.0	185.0	2	4	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	8	15.		15.0	
A1800		1.0	56.0		7.0	392.0	7	8	7.		7.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	122.0		5070.0	2	8	2.	122.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A1950		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		58.0	1160.0	58	8	58.		58.0	
A2182	60.0		3370.0	120.0		6740.0	2	8	2.	120.0		
A2184		2.0	55.0		4.0	110.0	2	8	2.		4.0	
A2390		1.0	5.0		10.0	50.0	10	8	10.		10.0	
A2480		1.0	28.0		5.0	140.0	5	8	5.		5.0	

Table VII-3(a) (Continued)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
A2580		1.0	97.0		3.0	291.0	3	8	3.		3.0	
A2660		5.0	90.0		5.0	90.0	1	8	1.		5.0	
A2685		1.0	10.0		4.0	40.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		2.0	50.0	2	4	2.		2.0	
A2900		2.0	30.0		2.0	30.0	1	4	1.		2.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0490		29.0	312.0		29.0	312.0	1	4	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	2	1.		8.1	
B1540		1.0	116.0		2.0	232.0	2	2	2.		2.0	
B1650		13.0	355.0		26.0	710.0	2	2	2.		26.0	
B1690		173.0	960.0		346.0	1920.0	2	2	2.		346.0	
B2220		4.2	140.0		4.2	140.0	1	2	1.		4.2	
C2010		.3	4.0		7.8	100.0	25	1	25.		7.8	
C2030		.5	6.0		12.0	150.0	25	1	25.		12.0	
C2040		.3	3.0		13.5	150.0	50	1	50.		13.5	
C2050		.8	7.0		18.7	175.0	25	1	25.		18.7	
C2060		.0	1.0		.1	5.0	5	1	5.		.1	
C2070		1.9	60.0		18.5	600.0	10	1	10.		18.5	
C2100		.2	3.0		1.0	18.0	6	1	6.		1.0	
C2160		.1	1.0		3.5	50.0	50	1	50.		3.5	
C2230		.0	1.0		.1	5.0	5	1	5.		.1	
C2250		.2	2.0		3.8	50.0	25	1	25.		3.8	
C2310		.7	2.0		17.0	50.0	25	1	25.		17.0	
C3020		1.0	16.0		1236.5	19984.0	1249	1	1249.		1236.5	
C4000		6.3	80.0		75.6	960.0	12	1	12.		75.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		19.6	240.0	6	1	6.		19.6	
C4110		1.1	10.0		51.8	480.0	48	1	48.		51.8	
C4140		.5	10.0		2.9	60.0	6	1	6.		2.9	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4290		11.0	180.0		10120.0	165600.0	920	1	850.		9350.1	70.
C4340		11.0	64.0		55.0	320.0	5	1	5.		55.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		3.9	390.0	390	1	390.		3.9	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	

Table VII-3(a) (Continued)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		11.7	240.0	6	1	6.		11.7	
C4790		7.7	40.0		84.6	440.0	11	1	11.		84.6	
C4870		6.4	85.0		44.6	595.0	7	1	7.		44.6	
C4880		3.6	8.0		210.0	472.0	59	1	56.		200.8	3.
C4930		.4	12.0		.7	24.0	2	1	2.		.7	
C4950		1.0	60.0		1.0	60.0	1	1	1.		1.0	
C4980		14.0	150.0		490.0	5250.0	35	1	32.		450.2	3.
C5090		4.0	196.0		8.1	392.0	2	1	2.		8.1	
C5110		2.7	14.0		95.8	504.0	36	1	34.		91.6	2.
C5200		3.8	4.0		83.2	88.0	22	1	22.		83.2	
C5320		8.2	162.0		138.7	2754.0	17	1	17.		138.7	
C5400		7.0	150.0		132.2	2850.0	19	1	19.		132.2	
C5410		9.0	131.0		18.0	262.0	2	1	2.		18.0	
C5820		25.0	353.0		600.0	8472.0	24	1	24.		590.5	
C5870		4.3	38.0		25.7	228.0	6	1	6.		25.7	
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5990		1.5	31.0		1.5	31.0	1	1	1.		1.5	
C6010		5.0	200.0		5.0	200.0	1	1	1.		5.0	
C6140		.2	7.0		1.3	49.0	7	1	7.		1.3	
C6215		6.0	84.0		6.0	84.0	1	1	1.		6.0	
C6220		.5	7.0		6.0	84.0	12	1	12.		6.0	
C6260		11.0	5.0		11.0	5.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		86.2	3084.0	12	1	12.		86.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6500		1.0	12.0		5.0	60.0	5	1	5.		5.0	
C6510		6.9	90.0		34.3	450.0	5	1	5.		34.3	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		1.1	111.0	111	1	111.		1.1	
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	153.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0530		.3	10.0		.3	10.0	1	2	1.		.3	

Table VII-3(a) (Concluded)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	828.0		10260.0	18	8	17.	765.7		1.
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	71.0		
D1020	134.0		7370.0	938.0		51590.0	7	8	7.	938.0		
D1100	18.0		900.0	540.0		27000.0	30	8	27.	490.8		3.
D1160	61.0		2400.0	1220.0		48000.0	20	8	18.	1109.5		2.
E0080		.1	3.0		4.3	108.0	36	1	36.		4.3	
E0090		.4	7.0		1.6	28.0	4	1	4.		1.6	
E0180		1.0	10.0		1.0	10.0	1	8	1.		1.0	
E0210		.0	1.0		.1	5.0	5	1	5.		.1	
E0230		4.0	68.0		4.0	68.0	1	8	1.		4.0	
E0290		.4	7.0		4.8	84.0	12	4	12.		4.8	
E0320		8.9	108.0		17.9	216.0	2	8	2.		17.9	
E0892		0.0	0.0		0.0	0.0	110	8	110.		0.0	
E0900		3.0	27.0		36.0	324.0	12	8	12.		36.0	
E0920		2.2	15.0		68.8	480.0	32	8	32.		68.8	
E0990		1.3	24.0		45.5	840.0	35	8	35.		45.5	
E1060		12.0	50.0		144.0	600.0	12	8	12.		144.0	
E1090		62.0	120.0		496.0	960.0	8	8	8.		496.0	
E1155		0.0	0.0		0.0	0.0	36	8	36.		0.0	
E1156		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1157		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1180		.0	2.0		1.1	72.0	36	8	36.		1.1	
E1240		.0	1.0		.6	20.0	20	8	20.		.6	
E1260		1.0	3.0		2.0	6.0	2	1	2.		2.0	
E1480	45.0		420.0	360.0		3360.0	8	8	8.	360.0		
E1530		4.2	68.0		4.2	68.0	1	8	1.		4.2	
E1760		.3	8.0		1.3	32.0	4	8	4.		1.3	
E1900		1.0	5.0		2.0	10.0	2	4	2.		2.0	
E1960		.1	2.0		.1	2.0	1	2	1.		.1	
E2030		1.1	39.0		3.4	117.0	3	2	3.		3.4	
GRAND TOTALS				4431.0	16656.6	412462.0	4051	.	3968.	4209.015824.0		

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 93.46
OR INDEX(CUBE) = 98.99
OR INDEX(TOTAL T/E) = 98.51

Table VII-3(b)

CONSTRAINED T/E FOR M1038 WHEN CONSTRAINED TO 85% OF AUTHORIZED T/E LIFT REQUIREMENT

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 92.5 PCT OR 15407.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 4099.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E**** CUBE	DEFIC-IENCY
A0005		5.0	159.0		5.0	159.0	1	8	1.		5.0	
A0090		3.0	47.0		39.0	611.0	13	8	13.		39.0	
A0265		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A0320		1.0	20.0		12.0	240.0	12	8	12.		12.0	
A0328		1.0	9.0		4.0	36.0	4	8	4.		4.0	
A0490		1.0	12.0		25.0	300.0	25	8	25.		25.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0922		1.0	3.0		15.0	45.0	15	8	15.		15.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		2.0	20.0	2	4	2.		2.0	
A1420		11.0	93.0		22.0	186.0	2	4	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	8	15.		15.0	
A1800		1.0	56.0		7.0	392.0	7	8	7.		7.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	122.0		5070.0	2	8	2.	122.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A1950		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		58.0	1160.0	58	8	58.		58.0	
A2162	60.0		3370.0	120.0		6740.0	2	8	2.	120.0		
A2184		2.0	55.0		4.0	110.0	2	8	2.		4.0	
A2390		1.0	5.0		10.0	50.0	10	8	10.		10.0	
A2480		1.0	28.0		5.0	140.0	5	8	5.		5.0	

Table VII-3(b) (Continued)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
A2580		1.0	97.0		3.0	291.0	3	8	3.		3.0	
A2660		5.0	90.0		5.0	90.0	1	8	1.		5.0	
A2685		1.0	10.0		4.0	40.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		2.0	50.0	2	4	2.		2.0	
A2900		2.0	30.0		2.0	30.0	1	4	1.		2.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0490		29.0	312.0		29.0	312.0	1	4	1.		29.0	
B0500		8.1	225.0		9.1	225.0	1	2	1.		8.1	
B1540		1.0	116.0		2.0	232.0	2	2	2.		2.0	
B1650		13.0	355.0		26.0	710.0	2	2	2.		26.0	
B1690		173.0	960.0		346.0	1920.0	2	2	2.		346.0	
B2220		4.2	140.0		4.2	140.0	1	2	1.		4.2	
C2010		.3	4.0		7.8	100.0	25	1	25.		7.8	
C2030		.5	6.0		12.0	150.0	25	1	25.		12.0	
C2040		.3	3.0		13.5	150.0	50	1	50.		13.5	
C2050		.8	7.0		18.7	175.0	25	1	25.		18.7	
C2060		.0	1.0		.1	5.0	5	1	5.		.1	
C2070		1.9	60.0		18.5	600.0	10	1	10.		18.5	
C2100		.2	3.0		1.0	18.0	6	1	6.		1.0	
C2160		.1	1.0		3.5	50.0	50	1	50.		3.5	
C2230		.0	1.0		.1	5.0	5	1	5.		.1	
C2250		.2	2.0		3.8	50.0	25	1	25.		3.8	
C2310		.7	2.0		17.0	50.0	25	1	25.		17.0	
C3020		1.0	16.0		1236.5	19984.0	1249	1	1249.		1236.5	
C4000		6.3	80.0		75.6	960.0	12	1	12.		75.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		19.6	240.0	6	1	6.		19.6	
C4110		1.1	10.0		51.8	480.0	48	1	48.		51.8	
C4140		.5	10.0		2.9	60.0	6	1	6.		2.9	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4290		11.0	180.0		10120.0	165600.0	920	1	815.		8964.5	105.
C4340		11.0	64.0		55.0	320.0	5	1	5.		55.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		3.9	390.0	390	1	390.		3.9	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	

Table VII-3(b) (Continued)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		11.7	240.0	6	1	6.		11.7	
C4790		7.7	40.0		84.6	440.0	11	1	11.		84.6	
C4870		6.4	85.0		44.6	595.0	7	1	7.		44.6	
C4830		3.6	8.0		210.0	472.0	59	1	55.		196.2	4.
C4930		.4	12.0		.7	24.0	2	1	2.		.7	
C4950		1.0	60.0		1.0	60.0	1	1	1.		1.0	
C4980		14.0	150.0		490.0	5250.0	35	1	31.		430.3	4.
C5030		4.0	196.0		8.1	392.0	2	1	2.		8.1	
C5110		2.7	14.0		95.8	504.0	36	1	34.		89.4	2.
C5200		3.8	4.0		83.2	88.0	22	1	22.		83.2	
C5320		8.2	162.0		138.7	2754.0	17	1	17.		138.7	
C5400		7.0	150.0		132.2	2850.0	19	1	19.		132.2	
C5410		9.0	131.0		18.0	262.0	2	1	2.		18.0	
C5820		25.0	353.0		600.0	8472.0	24	1	23.		585.7	1.
C5870		4.3	38.0		25.7	228.0	6	1	6.		25.7	
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5990		1.5	31.0		1.5	31.0	1	1	1.		1.5	
C6010		5.0	200.0		5.0	200.0	1	1	1.		5.0	
C6140		.2	7.0		1.3	49.0	7	1	7.		1.3	
C6215		6.0	84.0		6.0	84.0	1	1	1.		6.0	
C6220		.5	7.0		6.0	84.0	12	1	12.		6.0	
C6260		11.0	5.0		11.0	5.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		86.2	3084.0	12	1	12.		86.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6500		1.0	12.0		5.0	60.0	5	1	5.		5.0	
C6510		6.9	90.0		34.3	450.0	5	1	5.		34.3	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		1.1	111.0	111	1	111.		1.1	
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0530		.3	10.0		.3	10.0	1	2	1.		.3	

Table VII-3(b) (Concluded)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	828.0		10260.0	18	8	16.	738.1		2.
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	71.0		
D1020	134.0		7370.0	938.0		51590.0	7	8	7.	928.6		
D1100	18.0		900.0	540.0		27000.0	30	8	26.	464.1		4.
D1160	61.0		2400.0	1220.0		48000.0	20	8	18.	1068.7		2.
E0080		.1	3.0		4.3	108.0	36	1	36.		4.3	
E0090		.4	7.0		1.6	28.0	4	1	4.		1.6	
E0180		1.0	10.0		1.0	10.0	1	8	1.		1.0	
E0210		.0	1.0		.1	5.0	5	1	5.		.1	
E0230		4.0	68.0		4.0	68.0	1	8	1.		4.0	
E0290		.4	7.0		4.8	84.0	12	4	12.		4.8	
E0320		8.9	108.0		17.9	216.0	2	8	2.		17.9	
E0892		0.0	0.0		0.0	0.0	110	8	110.		0.0	
E0900		3.0	27.0		36.0	324.0	12	8	12.		36.0	
E0920		2.2	15.0		68.8	480.0	32	8	32.		68.8	
E0990		1.3	24.0		45.5	840.0	35	8	35.		45.5	
E1060		12.0	50.0		144.0	600.0	12	8	12.		144.0	
E1090		62.0	120.0		496.0	960.0	8	8	8.		496.0	
E1155		0.0	0.0		0.0	0.0	36	8	36.		0.0	
E1156		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1157		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1180		.0	2.0		1.1	72.0	36	8	36.		1.1	
E1240		.0	1.0		.6	20.0	20	8	20.		.6	
E1260		1.0	3.0		2.0	6.0	2	1	2.		2.0	
E1480	45.0		420.0	360.0		3360.0	8	8	8.	354.5		
E1530		4.2	68.0		4.2	68.0	1	8	1.		4.2	
E1760		.3	8.0		1.3	32.0	4	8	4.		1.3	
E1900		1.0	5.0		2.0	10.0	2	4	2.		2.0	
E1960		.1	2.0		.1	2.0	1	2	1.		.1	
E2030		1.1	39.0		3.4	117.0	3	2	3.		3.4	
GRAND TOTALS				4431.0	16656.6	412462.0	4051		3926.	4099.0	15407.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 90.20
OR INDEX(CUBE) = 98.48
OR INDEX(TOTAL T/E) = 97.76

Table VII-3(c)

CONSTRAINED T/E FOR M1038 WHEN CONSTRAINED TO 75% OF AUTHORIZED T/E LIFT REQUIREMENT

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 87.5 PCT OR 14575.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 3877.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0005		5.0	159.0		5.0	159.0	1	8	1.		5.0	
A0090		3.0	47.0		39.0	611.0	13	8	13.		39.0	
A0265		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A0320		1.0	20.0		12.0	240.0	12	8	12.		12.0	
A0328		1.0	9.0		4.0	36.0	4	8	4.		4.0	
A0490		1.0	12.0		25.0	300.0	25	8	25.		25.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0922		1.0	3.0		15.0	45.0	15	8	15.		15.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		2.0	20.0	2	4	2.		2.0	
A1420		11.0	93.0		22.0	186.0	2	4	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	8	15.		15.0	
A1800		1.0	56.0		7.0	392.0	7	8	7.		7.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	122.0		5070.0	2	8	2.	122.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A1950		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		58.0	1160.0	58	8	58.		58.0	
A2182	60.0		3370.0	120.0		6740.0	2	8	2.	120.0		
A2184		2.0	55.0		4.0	110.0	2	8	2.		4.0	
A2390		1.0	5.0		10.0	50.0	10	8	10.		10.0	
A2480		1.0	28.0		5.0	140.0	5	8	5.		5.0	

Table VII-3(c) (Continued)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFFIC-IENCY
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
A2580		1.0	97.0		3.0	291.0	3	8	3.		3.0	
A2660		5.0	90.0		5.0	90.0	1	8	1.		5.0	
A2685		1.0	10.0		4.0	40.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		2.0	50.0	2	4	2.		2.0	
A2900		2.0	30.0		2.0	30.0	1	4	1.		2.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	49.4		
B0490		29.0	312.0		29.0	312.0	1	4	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	2	1.		8.1	
B1540		1.0	116.0		2.0	232.0	2	2	2.		2.0	
B1650		13.0	355.0		26.0	710.0	2	2	2.		26.0	
B1690		173.0	960.0		346.0	1920.0	2	2	2.		346.0	
B2220		4.2	140.0		4.2	140.0	1	2	1.		4.2	
C2010		.3	4.0		7.8	100.0	25	1	25.		7.8	
C2030		.5	6.0		12.0	150.0	25	1	25.		12.0	
C2040		.3	3.0		13.5	150.0	50	1	50.		13.5	
C2050		.8	7.0		18.7	175.0	25	1	25.		18.7	
C2060		.0	1.0		.1	5.0	5	1	5.		.1	
C2070		1.9	60.0		18.5	600.0	10	1	10.		18.5	
C2100		.2	3.0		1.0	18.0	6	1	6.		1.0	
C2160		.1	1.0		3.5	50.0	50	1	50.		3.5	
C2230		.0	1.0		.1	5.0	5	1	5.		.1	
C2250		.2	2.0		3.8	50.0	25	1	25.		3.8	
C2310		.7	2.0		17.0	50.0	25	1	25.		17.0	
C3020		1.0	16.0		1236.5	19984.0	1249	1	1155.		1143.3	94.
C4000		6.3	80.0		75.6	960.0	12	1	12.		75.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		19.6	240.0	6	1	6.		19.6	
C4110		1.1	10.0		51.8	480.0	48	1	44.		47.9	4.
C4140		.5	10.0		2.9	60.0	6	1	6.		2.9	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4290		11.0	180.0		10120.0	165600.0	920	1	756.		8320.3	164.
C4340		11.0	64.0		55.0	320.0	5	1	5.		55.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		3.9	390.0	390	1	390.		3.9	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	

Table VII-3(c) (Continued)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		11.7	240.0	6	1	6.		11.7	
C4790		7.7	40.0		84.6	440.0	11	1	11.		84.6	
C4870		6.4	85.0		44.6	595.0	7	1	7.		44.6	
C4880		3.6	8.0		210.0	472.0	59	1	52.		193.6	7.
C4930		.4	12.0		.7	24.0	2	1	2.		.7	
C4950		1.0	60.0		1.0	60.0	1	1	1.		1.0	
C4980		14.0	150.0		490.0	5250.0	35	1	28.		397.5	7.
C5090		4.0	196.0		8.1	392.0	2	1	2.		8.1	
C5110		2.7	14.0		95.8	504.0	36	1	32.		84.8	4.
C5200		3.8	4.0		83.2	88.0	22	1	22.		83.2	
C5320		8.2	162.0		138.7	2754.0	17	1	17.		138.7	
C5400		7.0	150.0		132.2	2850.0	19	1	19.		132.2	
C5410		9.0	131.0		18.0	262.0	2	1	2.		18.0	
C5820		25.0	353.0		600.0	8472.0	24	1	22.		545.1	2.
C5870		4.3	38.0		25.7	228.0	6	1	6.		25.7	
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5990		1.5	31.0		1.5	31.0	1	1	1.		1.5	
C6010		5.0	200.0		5.0	200.0	1	1	1.		5.0	
C6140		.2	7.0		1.3	49.0	7	1	7.		1.3	
C6215		6.0	84.0		6.0	84.0	1	1	1.		6.0	
C6220		.5	7.0		6.0	84.0	12	1	12.		6.0	
C6260		11.0	5.0		11.0	5.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		86.2	3084.0	12	1	12.		86.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6500		1.0	12.0		5.0	60.0	5	1	5.		5.0	
C6510		6.9	90.0		34.3	450.0	5	1	5.		34.3	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		1.1	111.0	111	1	111.		1.1	
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	15.0		.6	16.0	1	2	1.		.6	
D0530		.3	10.0		.3	10.0	1	2	1.		.3	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	

Table VII-3(c) (Concluded)

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
D0840	46.0		570.0	828.0		10260.0	18	8	15.	596.2		3.
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	70.3		
D1020	134.0		7370.0	938.0		51590.0	7	8	6.	860.9		1.
D1100	18.0		900.0	540.0		27000.0	30	8	25.	441.7		5.
D1160	61.0		2400.0	1220.0		48000.0	20	8	17.	1006.8		3.
E0080		.1	3.0		4.3	108.0	36	1	36.		4.3	
E0090		.4	7.0		1.6	28.0	4	1	4.		1.6	
E0180		1.0	10.0		1.0	10.0	1	8	1.		1.0	
E0210		.0	1.0		.1	5.0	5	1	5.		.1	
E0230		4.0	68.0		4.0	68.0	1	8	1.		4.0	
E0290		.4	7.0		4.8	84.0	12	4	12.		4.8	
E0320		8.9	108.0		17.9	216.0	2	8	2.		17.9	
E0892		0.0	0.0		0.0	0.0	110	8	110.		0.0	
E0900		3.0	27.0		36.0	324.0	12	8	12.		36.0	
E0920		2.2	15.0		68.8	480.0	32	8	32.		68.8	
E0990		1.3	24.0		45.5	840.0	35	8	35.		45.5	
E1060		12.0	50.0		144.0	600.0	12	8	12.		144.0	
E1090		62.0	120.0		496.0	960.0	8	8	8.		496.0	
E1155		0.0	0.0		0.0	0.0	36	8	36.		0.0	
E1156		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1157		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1180		.0	2.0		1.1	72.0	36	8	36.		1.1	
E1240		.0	1.0		.6	20.0	20	8	20.		.6	
E1260		1.0	3.0		2.0	6.0	2	1	2.		2.0	
E1480	45.0		420.0	360.0		3360.0	8	8	7.	331.7		1.
E1530		4.2	68.0		4.2	68.0	1	8	1.		4.2	
E1760		.3	8.0		1.3	32.0	4	8	4.		1.3	
E1900		1.0	5.0		2.0	10.0	2	4	2.		2.0	
E1960		.1	2.0		.1	2.0	1	2	1.		.1	
E2030		1.1	39.0		3.4	117.0	3	2	3.		3.4	
GRAND TOTALS				4431.0	16656.6	412462.0	4051	.	3756.	3877.0	14575.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 85.54
OR INDEX(CUBE) = 96.31
OR INDEX(TOTAL T/E) = 95.38

Table VII-3(d)

T/E ITEM DEFICIENCIES OF M1038 WHEN CONSTRAINED TO 90%, 85% AND 75% OF AUTHORIZED T/E LIFT REQUIREMENT

TAM Number	Nomenclature	Authorized T/E Quantity	Constrained T/E Quantity			Square Loaded Items (*)
			90%	85%	75%	
C3020	Armor, body	1249	-	-	94	
C4110	Bag, water, 36 gal	48	-	-	4	
C4290	Carrier, grenade, cloth	756	70	105	164	
C4880	Food container	59	3	4	7	
C4980	Heater, immersion	35	3	4	7	
C5110	Jug, vacuum, 3 gal	36	2	2	4	
C5820	Range, outfit, field	24	-	1	2	
D0840	Trailer, amphib, cargo ¼ ton	18	1	2	3	*
D1020	Truck, cargo, 1¼ ton	7	-	-	1	*
D1100	Truck, platform, utility, ½ ton	30	3	4	5	*
D1160	Truck, utility, ¼ ton	20	2	2	3	*
E1480	Rifle 106mm	8	-	-	1	*

aid is the computational power of the computer, leaving the staff planner free to apply judgmental considerations to accurately presented data. This action can also be done at any command level, from the company/battery to any higher level staff having access to the computer system supporting CALAS.

For the sample unit T/Es of Table VII-3, a value of 85 percent is selected as the acceptable constraint level. For this level a 29 percent short fall still exists. This means that the exercise of other options within CALAS is now required.

Table VII-3a, b, c, d illustrates the information the operational planner obtained from the output listings of the CONTEAM Program to assist him in making the decision as to "what" and "how much" equipment can be safely removed from a unit's T/E but still leave the unit operationally viable. The heading of the output lists the unit and its description, plus the percentage and amount the unit is being constrained in both bulk and square. The body of the listings itemizes each item of equipment in the unit's authorized T/E. For each T/E item, the square, cube, weight, T/E quantity, and criticality is printed. Next to the authorized T/E quantity is the reduced quantity and item deficiency obtained after exercising the model with the applied constraint value in the heading. Totals are given for the square, cube, and weight of the unit, both before and after the unit is constrained. At the bottom of each listing are three operational readiness indices that indicate the degree the elimination of T/E items has reduced the unit's operational readiness--as far as square items, cube items, and the combination of both square and cube items are concerned. The reader may want to refer to Appendix F for a detailed explanation of the rationale and mathematics of the CONTEAM model and operational readiness index. By referring to Appendix C, Part 4, he may obtain a more detailed explanation of CONTEAM's output.

At this point the reader should be reminded that in assigning criticalities, the importance of an item of equipment to a unit's mission can be derived by relating its usage to a specific function of that unit and, in turn, determining the relative importance of the specific functions to the unit's combat mission. M1038 has primary functions of infantry combat/small arms employment, mobility, and communications; secondary functions of intelligence, demolition/obstacle clearance, medical, air support control, power generation, and comm/elect maintenance; and tertiary functions of supply, maintenance (except comm/elect) and service support. Any T/E item that supports M1038's primary function was assigned a criticality of 8. Criticalities of 4 and 2 were assigned to those items that supported M1038's secondary and tertiary functions. If the T/E item did not serve either the unit's primary, secondary, or tertiary function, it was given a criticality of 1. Examples of the criticality assignment can be seen by again referring to Table VII-3. TAM A0005, a radio set accessory kit, serves one of M1038's primary functions, communications, and, therefore, has a criticality of 8. A0710, a generator signal, serves the secondary function of comm/elect maintenance and has a criticality of 4.

When the planner is confronted with the reality that he lacks the lift capacity to carry a unit's, such as M1038, entire authorized T/E in the assault echelon shipping, he may consult a series of constrained T/E tables for that unit which itemizes the equipment to be left out of the AE lift for each constraint. Table VII-3 depicts the items of equipment that would be omitted from the load list of M1038 under constraints of 90, 85, and 75 percent. Because of the weighting factors applied to each assault echelon unit, explained earlier, the true constraints for M1038 are 95, 92.5, and 87.5 percent.

Table VII-3d summarizes the numbers of each T/E item that would be eliminated from the complete T/E of unit M1038, as determined by CONTEAM for the various constraints. By reviewing such a table of deleted equipment, the planner is better able to determine the maximum constraint acceptable for a unit when it is forced to reduce its normal T/E. The planner is also in the position to make manual adjustments in the constrained T/E if he deems it necessary. Suppose, for example, he observes that one E1480, a 106mm rifle, is omitted from the load list of M1038 when it is constrained to 75 percent of full strength. Further, assume he determines the omission of this item to be unacceptable. It is perfectly permissible for him to include this item in the final load list, but only after he has eliminated one or more square loaded items of comparable square. He may adjust the final constrained T/E by hand, or he may assign artificially high criticalities to those items he wishes to force into the final load list and then rerun CONTEAM.

Careful examination of Table VII-3 results in the following general characteristics of the CONTEAM Model. For TAM items that occur in a unit's T/E with authorized quantities of 1 to 20, the program will include TAMs with the highest criticality and exclude TAMs with the next-to-highest criticality when the constraint amounts to 65-75 percent of the space required to load the unit's full strength T/E. Of the TAMs with low criticality, the bulky ones will be excluded, but usually only in part. Nonpriority TAMs may be completely excluded from the constrained T/E.

For items that appear in the unit's T/E with authorized quantities of 40-1200, the model will exclude some portion of the full T/E quantity in almost every case--even for the highest criticality items. This is purely a function of CONTEAM's algorithm as it begins to favor the first units of low priority items over, say, the 100th unit of a

higher priority item. Again, experience shows these results to be useful; however, the model can be modified if the planner feels this is necessary.

Each unit in the assault echelon is submitted to constraints similar to those applied to M1038, and a unit-by-unit inspection of the tentative, constrained T/Es is made. Finally, after each unit's T/E is stripped of the items of equipment the planner determines can be left out of the assault echelon, he is in the position to determine if his constrained force is within his lift capacity.

The CCF model also prints a table of constrained cargo values for bulk and square loaded items for each unit and a table of factored cargo categories found in Appendix C. These tables are useful when evaluating the effects on unit T/Es from applying constraints. The tables should be used when evaluating the constrained T/E of Table VII-3. As an example of the information contained in Appendix C, Table VII-4(a) contains three units, showing the part of bulk cargo that is T/E and the

Table VII-4(a)

CONSTRAINED CUBE FOR CLASSES
IIW AND VIIW NONSQUARE AND VIIW SQUARE
(T/E Categories Only)

Constraint = .75					
Unit	Weighted Code	Constrained Bulk	Bulk	Constrained* Square	Square
M1038	1	515	589	3908	4427
M1128	1	321	367	20322	23016
M8821	3	33	53	1380	2181

*These values include square mountout.

Table VII-4(b)

CONSTRAINED FACTORED CARGO CATEGORIES

Constraint = .75								
Unit	Bulk Total[1]	Constrained T/E[2]	MO[3]	OMA[4]	Constrained Bulk[5]	Square T/E[6]	Constrained Square T/E[7]	Constrained Square[8]
M1038	1014.4	515.0	427.3	0	942.0	4426.8	3873.4	3908.0
M1128	1678.5	320.8	1312.8	0	1633.0	23015.8	20138.8	20322.0
M8821	87.0	33.3	33.8	0	67.0	2180.6	1362.9	1380.0

[1] Total bulk in MT.

[2] Constrained T/E in MT.

[3] Mountout in MT.

[4] Organizational Maintenance Activity (OMA) for classes IIA and VIIA nonsquare.

[5] Total constrained bulk cargo.

[6] Square loaded T/E items.

[7] Constrained square loaded T/E items.

[8] Total constrained square loaded items.

reduced measurement tons of the T/E from applying the constraint (CON BULK). The T/E for square loaded items in square feet is also shown, with the reduced T/E square feet also from applying the constraint. These figures represent the amount of a unit's T/E to be loaded and the constrained allotted space available for loading provided by the weighted constraint. Table VII-4(a) also shows the weighted constraint code used by the model to compute the materiel reduction. Table VII-4(b) shows additional cargo categories factored from the totals. It should be remembered that the cargo is composed of T/E and mountout. Using the list of items deleted from the T/E accounting for the reduced amount of T/E contained in Table VII-3, an evaluation can be made of the acceptability of a given constraint on the reduced T/E of a unit.

5. Varying the Mountout

The next option to be exercised in finding the solution to the constrained loading problem is to change the DOS for the mountout carried by the AE. Since the run parameters for the MAGTF data were 15 DOS for the AE, a change to 10 DOS will be tried to determine the significance of the reduction in lift short fall. Table VII-5 presents the CCF Model results from this change. It is noted that the unconstrained short fall from this option is 32 percent, indicating that a 5 DOS reduction in mountout permitted total loading to occur at 76.5 percent constraint instead of at 70.8 percent for 15 DOS. Graphical results are found in Figure VII-3. Here again, the planner consults Table VII-3 to evaluate the T/E reduction occurring at 77 percent, when constrained loading is indicated, along with the desirability of limiting accompanying supplies to 10 DOS for the AE.

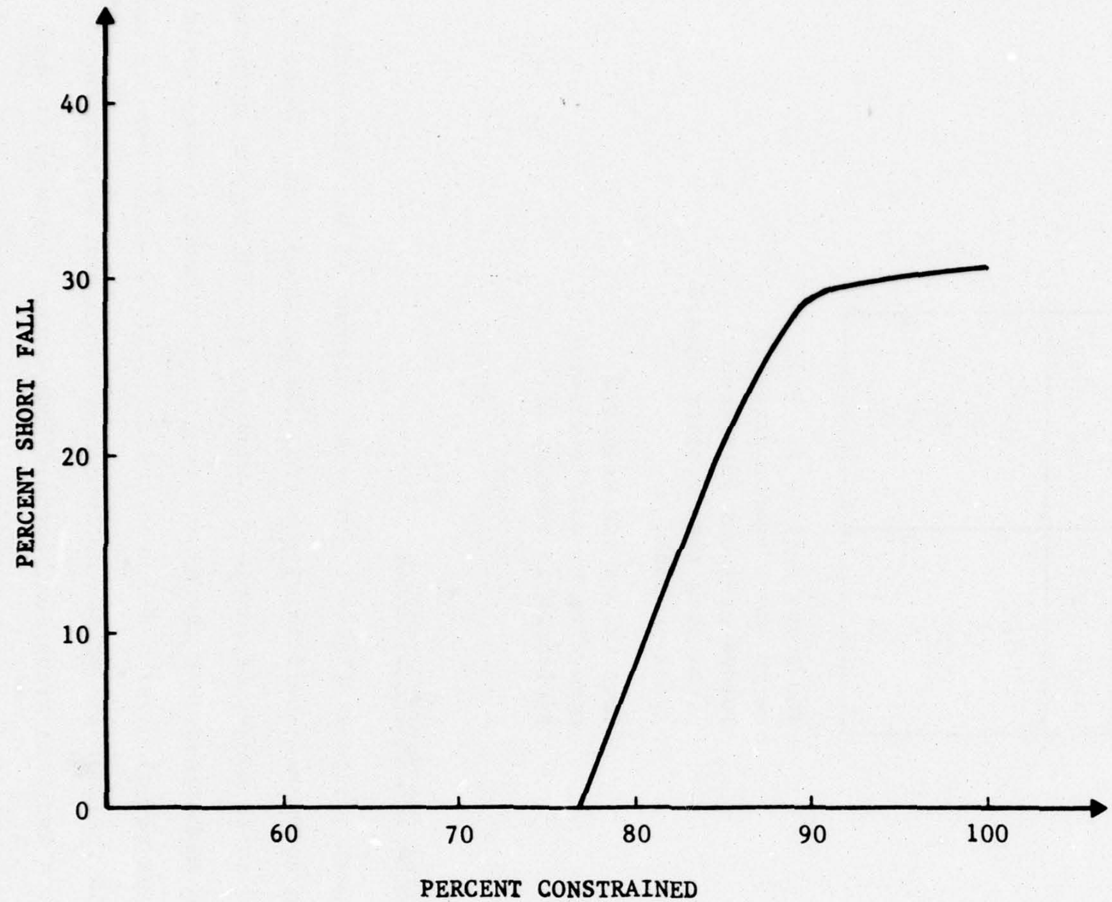

FIGURE VII-3. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR AE UNITS USING 10 DOS MOUNTOUT

Table VII-5

WEIGHTED CONSTRAINED UNIT LOADING
VS PERCENT SHORT FALL

Percent	
Short Fall*	Constraint†
32%	100%
29	90
20	85
8	80
0	77

*The short fall is for bulk cargo since square cargo is loaded at about 88 percent permitting reallocating square space to bulk.

†Constraints are weighted according to unit's mission as explained in Section VI.

C. Changing the Force Structure

The next option available to the staff planner is the elimination of certain units and their functions from the AE troop list. Those eliminated units would, of course, be embarked in AFOE support shipping. It must be emphasized that the option to eliminate certain units would exist if the actual mission and expected tactical situation permits such action. In the analysis of the notional MAF deployment without the effects of a tactical situation, certain units are eliminated to show tradeoffs between reduced total lift requirements and a reduced amount of materiel eliminated from the included units. In other words, an evaluation must be made of the relative advantages to be gained from

eliminating whole units, thus changing the force structure and decreasing the materiel eliminated from remaining units as opposed to greater reductions from all original units and a possible change in the amount of accompanying supplies.

The units chosen for elimination are listed in Table VII-6. These units are characterized by the possibility that their deployment ashore may not be required for a sufficient period of time to permit their being embarked and unloaded from the AFOE support ships. The action to remove units from the AE troop list and include them in the AFOE constitutes the phasing of units or detachments into the objective area at a later time--after unloading of AFOE units begins. Since there is some risk that the eliminated units may be required ashore before, say D+5, the factors affecting the earliest unloading times for the AFOE are revelant to the study. Analysis of unloading assault shipping and the beach support and cargo handling problems ashore were therefore included in the study. Results from this analysis and the practicality of phasing ashore certain original AE units from AFOE support ships will be presented in later subsections.

1. Third and Fourth Echelon Maintenance Elimination

Possible candidates for phased entry into the objective area are the units and detachments of the maintenance battalion, FSSG. Instead of deploying these organizations ashore from assault shipping, two maintenance contact teams for each area of maintenance, i.e., engineer, motor transport, ordnance, communication/electronics, are included in the assault echelon. Each contact team would consist of one vehicle and two experienced technicians with the necessary equipment and some highly demanded repair parts. Repair of equipment would be generally restricted to component replacement. The maintenance concept for the FSSG provides

Table VII-6

ELIMINATED AE UNITS

Function	Unit	Quantity	Description
CSS/Maintenance	M3223X	1	Det MT Maintenance Company
	M3233F	1	MT Maintenance Company /-/
	M3243X	1	Engineer Maintenance Company
	M3247F	1	H&S Company /-/ Maintenance Bn
	M3253X	1	Electronic Maintenance Company
Force Engineer	M0305	1	Support Company /-/ Engineer Spt Bn
	M0307	1	Hq Company /-/ Engineer Spt Bn
	M3751X	1	Bulk Fuel Company, Engineer Spt Bn
	M3753X	2	Engineer Company, Engineer Spt Bn
Combat Support	M4193	1	175 Gun Battery
	M4201	1	Searchlight Battery
	M4226	1	Hq Battery, Forward Air Group
	M8621X	1	Missile Battery
Aviation CSS	M8821	2	MATCU
	M8914X	2	H-MS (single site)
	M8921	2	MABS (single site)

for contact teams as a part of normal maintenance procedures. Additional personnel from the maintenance battalion would be required to coordinate the preliminary maintenance effort. The landing force supply of the AE includes a large pool of operationally ready float items and secondary reparables for replacement of "wash out" end items and components. In effect, this option provides for a minimum size detachment from maintenance battalion to conduct emergency repairs and end item replacement during the period from D-Day to about D+3 to D+7 when the MAF maintenance organizations are unloaded and put into operation. The time phased deployment of maintenance unit increments are dependent on the timing of the unloading of assault shipping. As stated, a discussion of this problem is presented later.

The tradeoff in lift requirements is presented in Table VII-7. The reduction in square loading requirements will have a significant impact on overall lift requirements when combined with the other options to be discussed for AE troop list modification. These results, of course, are for a notional MAF structure without the specification of a mission. The reduction in lift obtained in this analysis demonstrates how incremental phasing of units into the objective area reduces lift requirements for the AE embarked in assault shipping, permitting minimum support levels for committed units during a short period of time. A specific mission and scheme of maneuver ashore in an actual operation will, of course, dictate the bounds on tailored maintenance detachments which are included in the AE and phased ashore from the AFOE at some later time.

2. <u>Motor Transport Functions</u>

The greatest demand for square loaded space in assault ships is derived from the number of vehicles embarked. Motor transport assets provide tactical mobility for combat units, mobility for unit cargo,

Table VII-7

AMPHIBIOUS LIFT TRADEOFF FROM SUBSTITUTING MAINTENANCE CONTACT TEAMS FOR MAINTENANCE UNITS IN THE AE

Unit	Bulk/MT	Square
M3223X	571	11276
M3243X	814	7131
M3233F	43	1455
M3247F	127	1975
M3253X	210	2741
Total	1765	24578
8 Contact teams*		1480
Net lift reduction	1765	23098

*Contact team materiel is mobile loaded in one vehicle per team.

supply point distribution capability for artillery and tank units, and logistic mobility in support of the development of beach support (BSA) and logistic support areas (LSA) ashore. In the area of constrained amphibious lift assets, excess motor transport included in embarked materiel cannot be tolerated. Therefore, careful planning must be exercised when preparing a troop list for an actual operation to include only those motor transport assets that must be landed from assault shipping. Incremental phasing of excess vehicles or detachments of motor transport units into the objective area via the AFOE after considering time delays constitutes this alternative course of action. A major consideration is the expected time when sufficient terrain in the objective area is controlled to permit the utilization of vehicles ashore to any great degree.

An analysis[1] of the number of vehicles required to conduct beach clearing operations sufficient to prevent congestion in the beach support area and to permit movement of materiel smoothly from the BSA to the LSA provides the source for determining the minimum number of vehicles for this function. Table VII-8 lists these vehicle quantities.

Table VII-8

EQUIPMENT NECESSARY TO SUPPORT
BEACH CARGO HANDLING FUNCTION

Equipment	Quantity
Rough terrain forklift	20
Beach crane	6
2½-ton truck	182
5-ton truck	48
12-ton semi	20
Total 5-ton equivalents	179

When comparing the quantities of Table VII-8 to the vehicles in the CSS units of the AE, a sufficient number of vehicles and forklifts were included. Table VII-9 shows these quantities. Since many of these vehicles are not part of a motor transport organization, their use in the logistics mobility function must be assumed for at least three days.

The CSS structure and its detachments have been designed at minimum support levels, indicated by the values in Table VII-9. No reduction in these vehicles by units was indicated. In fact, a shortage of fourteen 5-ton equivalents is observed. The remaining vehicles may also be obtained from other units temporarily to keep the total number of vehicles embarked in the AE at a minimum. When AFOE units begin to

Table VII-9

LOGISTIC SUPPORT VEHICLES AE

Equipment	Quantity
Forklifts	41
$2\frac{1}{2}$-ton trucks	184
5-ton trucks	72
12-ton semi	1
Total 5-ton equivalents	165

land, a sufficient number of vehicles are included in the CSS structure[2] to perform all missions. The scenario for this study included the landing of two RLTs by helicopter. Because of this, a total of five CH-46 squadrons are embarked in assault shipping. These helicopters will also be available to provide some tactical and logistical mobility to the AE after the lift of assault troops is completed, and before the landing of additional motor transport assets. Here again, the existence of a mission and tactical situation will prescribe tailored motor transport detachments. As a matter of interest, the original notional MAF AE had 483 5-ton equivalents in vehicles from all units.

3. The Force Engineer Function

Force engineer units have been included in the AE troop list of the CSS notional MAF. In addition, the Division Support Group has an engineer battalion performing the combat engineer function, and the Naval Beach Group has the Naval Amphibious Construction Battalion for engineer operations in the beach areas. Under certain circumstances, force engineer units may be phased into the objective area from the AFOE without loss of any combat capability to the AE. The tradeoff in reduced lift requirements is shown in Table VII-10.

Table VII-10

AMPHIBIOUS LIFT TRADEOFF FROM PHASING FORCE ENGINEER UNITS INTO THE AOA FROM AFOE SUPPORT SHIPS

Unit	Bulk/MT	Square
1 M0305F	212	11914
1 M0307F	24	571
1 M3751X	2220	7847
2 M3753X	1602	17768
Total	4058	38100

Phasing these units into the objective area at a later time provides a significant reduction in lift requirements for the AE.

4. The Combat Support Function

Certain combat support functions provided by units included in the AE may also be candidates for phased deployment into the objective area. The units selected for phased deployment are listed in Table VII-11.

Table VII-11

COMBAT SUPPORT UNITS SELECTED FOR PHASED DEPLOYMENT

Unit	MT	Square
M4226	677	8661
M4201	67	2019
M4193	417	10497
M8621X	115	4831
Total	1276	26008

Phasing these units provides another significant reduction in the lift requirements of the AE.

Most of these reductions constitute the field artillery group (FAG) with one 175mm gun battery. Two general support batteries were included with the AE, i.e., one 8" howitzer battery and one 175mm gun battery. The division artillery regiment also includes three 155mm howitzer batteries. Limited naval gunfire ships and the planned close air support serve as other means of fire support for the landing force. The mission and tactical situation will provide the deciding factors for phasing the FAG units into the objective area.

In the case of the light antiaircraft missile battery, deployment tactics generally prohibit one battery deployed alone without the usual control agencies from the tactical air control system. The degree of air defense added by including one battery is generally not significant. Many arguments for and against, including the battery in the AE, could be advanced. The tradeoff in lift requirements is evident from Table VII-11.

5. The Aviation CSS Units

Certain aviation units are present in the AE to be landed for the purpose of operating a Short Air Field for Tactical Support (SATS), or expeditionary airfield. Other units provide intermediate level maintenance when operating ashore to the aircraft squadrons initially embarked in the LPAs or LHAs. Current Marine Corps policy, as well as the assault shipping short fall, prohibits loading SATS equipment in assault shipping. The units providing intermediate level maintenance do not perform their primary function while embarked in assault shipping since all the AE aircraft operate from the LPHs and LHAs. The possibility exists for phasing the units in Table VII-12 into the objective area from AFOE support ships without loss of operational capability to the AE.

Table VII-12

AVIATION CSS UNITS SELECTED FOR PHASED DEPLOYMENT

Unit	MT	Square
2 M8914X	360	9602
2 M8821	174	4362
2 M8921	6476	34474
Total	7010	48438

The tradeoffs in reduced amphibious lift requirements from phasing the units in Table VII-12 are very significant.

6. The Effect of Incremental Phasing of Units Into the Objective Area

The tradeoff in lift requirements from phasing units ashore from AFOE support ships in the preceding section is presented in Figure VII-4. The curve in this graph indicates a reduction in total lift requirements which are from 77,624 to 63,704 measurement tons, and from 786,926 to 654,815 square feet. The percent short fall in loading assault shipping is reduced from 39 to 9 percent. A weighted constraint of 93 percent enables loading of the AE.

While the extent of phasing certain units and their functions ashore from the AFOE support ships, presented here, may be greater than would be acceptable under an actual operational commitment, the dramatic effect in reduced lift requirements of removing these units from the AE troop list is inescapable. Figure VII-5 compares the curve of the CSS notional MAF AE constrained loading analysis, from Figure VII-1, with the reduced AE force structure of Figure VII-4. The effect of any variations considered acceptable to the commander and his staff in the

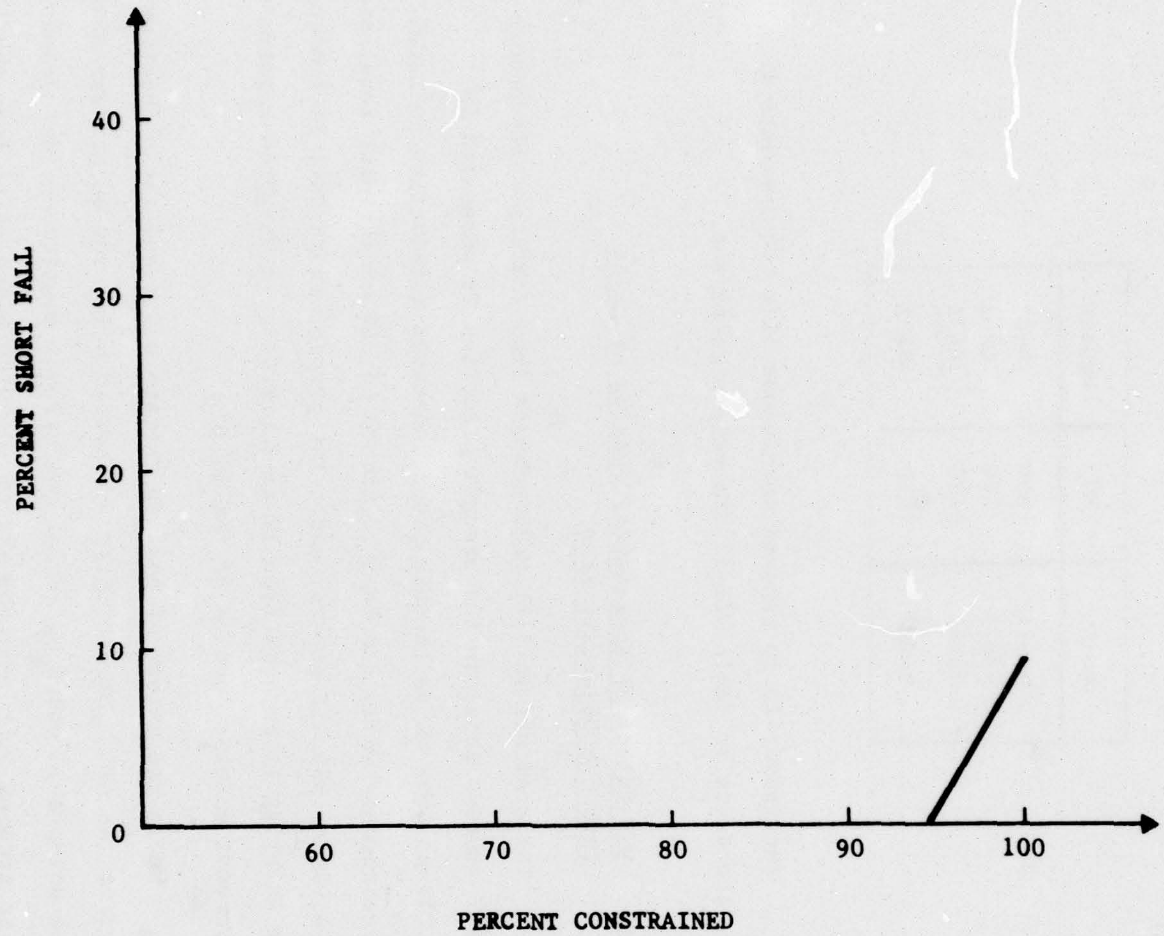

FIGURE VII-4. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR REDUCED AE FORCE STRUCTURE

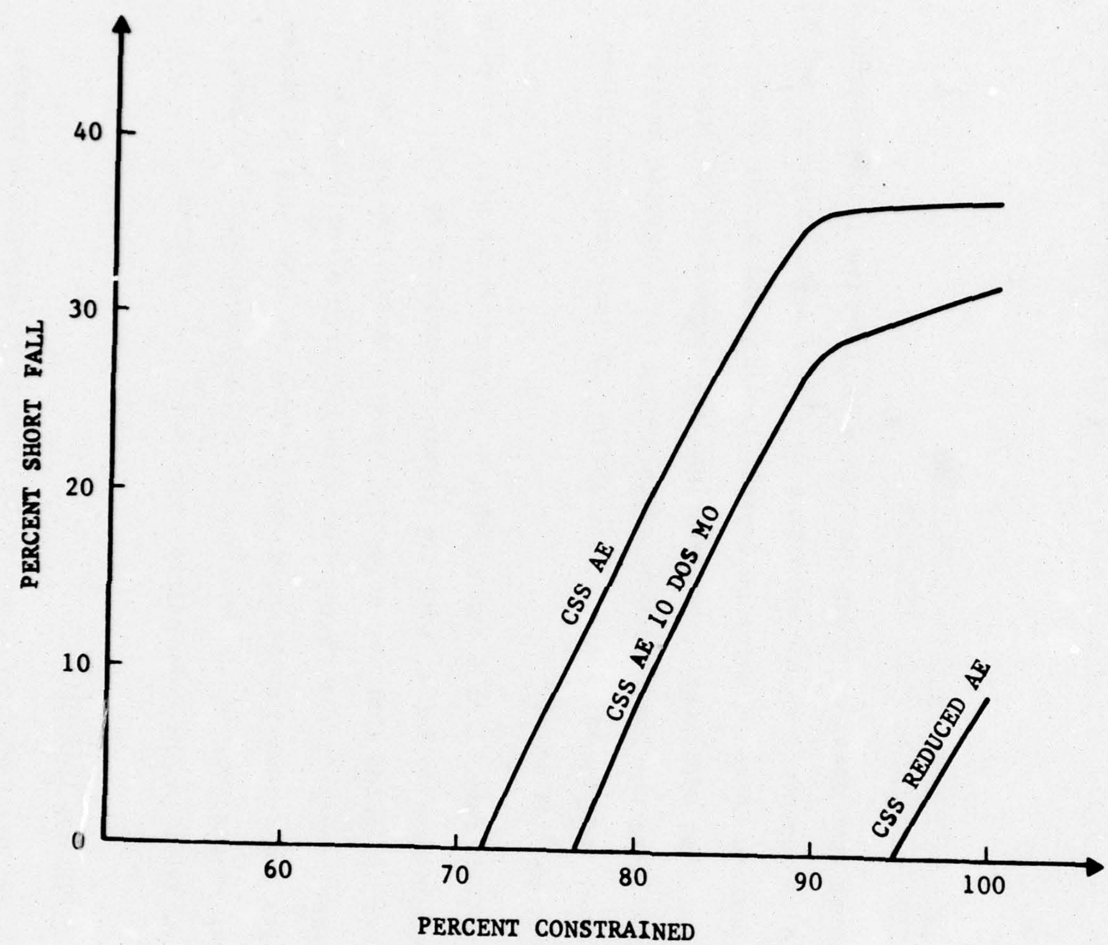

FIGURE VII-5. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL COMPARING THE AE OF THE CSS NOTIONAL MAF WITH THE REDUCED AE FORCE STRUCTURE

force structure can be visualized from the two curves of Figure VII-5. The combinations of changing the troop list, the DOS of mountout, and an acceptable constraint level provide the procedure for solving the constrained amphibious lift problem. With a change in the scenario to include airlift, an additional curve may be constructed on the same graph as Figure VII-5 to indicate that effect on the constrained loading problem.

D. The Timing Problem in Phasing Materiel Into the Amphibious Objective Area

The time when ships carrying the AFOE should arrive in the objective area would be dependent on the unloading rate of assault shipping, which, in turn, permits unloaded ships to depart, limiting the number of ships in the area. Two additional considerations are the ability of organizations controlling the beach to keep cargo moving into logistic support areas without congestion, and the availability of Navy crews to unload common user sealift ships.

The MMROP states that a number of AFOE support ships will arrive in the objective area on D-Day, with the remainder arriving by D+5. It has been previously noted that the unloading rate of assault ships, to a large degree, controls the timing factor of how long after D-Day AE troop units and detachments phasing ashore from the AFOE will be landed. Therefore, an analysis of the problems of unloading assault shipping becomes relevant to the constrained amphibious lift problem.

1. The GAMUT Simulation

SRI has conducted a number of studies of amphibious assault landing craft for the Naval Ship Systems Command[3]. The analytical support for these studies was provided by a computer simulation model called

GAMUT. This model, "...simulates all of the principal actions in an amphibious assault, including the activities of LVTs, landing craft, helicopters, and ships. It assesses attrition, monitors the status of off loading and of delivery to the shore, and collects statistics useful in analysis"[3]. One of the outputs from GAMUT needed in this study are the offloading rates of amphibious assault ships. In order to add the additional dimension of timing to the phasing of units into the objective area from the AFOE, GAMUT runs were made using MAGTF lift data in order to compute the unloading rates for the assault ship types used in this analysis. Runs were made using conventional landing craft with standoff distances of 5 and 25 nautical miles (nmi), and with advanced landing craft using a 25-nmi standoff distance. Table VII-13(a) lists the input parameters for runs 1 and 2 for conventional landing craft. Table VII-13(b) lists the input parameters for run 3 using advanced landing craft.

2. Simulated Results

Results from runs 1 and 3 are contained in Tables VII-14 and VII-15. The rates for only run 2, using conventional landing craft at a 5-nmi standoff distance, are listed in Table VII-16. At a 25-nmi standoff distance, the LVTs must be transported to the line of departure by the ships in which they are embarked. When using advanced landing craft, the LVTs were also carried to the line of departure, but by the advanced landing craft.

The obvious difficulties of this procedure for the conventional landing craft at 25 nmi run tend to reduce its usefulness. Unloading times for this run were therefore not presented.

Table VII-13(a)

PROGRAM GAMUT INPUT PARAMETERS: RUNS NO. 1 AND NO. 2

	Type 1 Craft	Type 2 Craft	Type 3 Craft	All Craft
Craft	LCM6	LCM8	LCU	
Number	111	34	40	185
Speed (kts)	8	8	10	
Capacity (pounds)	68,000	120,000	380,000	

	Type 4 Helo.	Type 5 Helo.	Type 6 Helo.	All Helo.
Helicopter	UH-1N	CH-46	CH-53	
Number	0	90	63	153
Speed (kts)	130	130	150	
Capacity (pounds)	2,500	4,900	8,600	

Special situation at 20 hours	
Standoff distance, nautical miles	Run No. 1 = 25, Run No. 2 = 5
Sea state	03
Number of small craft deckloaded	48
Percent of cargo available to helos	50
Beach slots, ACVs	0
Beach slots, LPHs	32
Number of LST causeways	4
Time to install causeways (minutes)	240

LVTs discharged near the waterline by well-ship.
General unloading starts after 350,000 sq ft of vehicles have been offloaded.
Attrition rates decrease exponentially with time.

Table VII-13(b)

PROGRAM GAMUT INPUT PARAMETERS: RUN NO. 3

	Type 1 Craft	Type 2 Craft	Type 3 Craft	All Craft
Craft	C30	P125	Jeff(B)	
Number	92	0	70	162
Speed (kts)	50	35	50	
Capacity (pounds)	30,000	125,000	150,000	

	Type 4 Helo.	Type 5 Helo.	Type 6 Helo.	All Helo.
Helicopter	UH-1N	CH-46	CH-53	
Number	0	90	63	195
Speed (kts)	130	130	150	
Capacity (pounds)	2,500	4,900	8,600	

Special situation at 20 hours	
Standoff distance, nautical miles	25
Sea state	03
Number of small craft deckloads	32
Percent of cargo available to helos	50
Beach slots, ACVs	32
Beach slots, LPHs	0
Number of LST causeways	4
Time to install causeways (minutes)	240

All LVTs preloaded on craft.
LVTs discharged near the waterline by craft.
General unloading starts after 350,000 sq ft of vehicles have been offloaded.
Attrition rates decrease exponentially with time.

Table VII-14

SHIP UNLOADING RATES AND TIMES: CONVENTIONAL LANDING CRAFT
(Run No. 1, 5-nmi Standoff)

	Ship No.	Type	Tons (short tons)	Rate (tons/hr)	Hours
1	30	LKA	3,006	88	34
2	31	LKA	3,031	88	34
3	32	LKA	3,006	88	34
4	34	LKA	1,455	88	17
5	48	LKA	1,653	88	19
6	49	LKA	1,094	88	12
7	33	LPA	644	88	7
8	47	LPA	1,722	88	20
9	2	LHA	3,156	74	43
10	2	LHA	3,156	74	43
11	2	LHA	3,156	74	43
12	2	LHA	3,156	74	43
13	7	LPD	1,330	64	21
14	8	LPD	1,383	64	21
15	9	LPD	1,197	64	19
16	10	LPD	1,257	64	20
17	11	LPD	1,110	64	17
18	12	LP[illegible]	1,305	64	20
19	41	[illegible]	1,011	64	16
20	42	LPD	1,281	64	20
21	43	LPD	1,152	64	18
22	44	LPD	1,331	64	21
23	46	LPD	1,329	64	21
24	13	LSD	Each LSD carried 48 LVTs with 24 troops/LVT; the LVTs were immediately offloaded (not counted in tons/hr rate)		
25	14	LSD			
26	15	LSD			
27	16	LSD			
28	17	LSD	140	21	6
29	18	LSD	221	21	10
30	19	LSD	221	21	10
31	50	LSD	221	21	10
32	51	LSD	221	21	10
33	54	LSD	221	21	10
34	55	LSD	221	21	10
35	20	LST	737	28	26
36	21	LST	737	28	26
37	22	LST	737	28	26
38	23	LST	737	28	26
39	24	LST	737	28	26
40	25	LST	737	28	26
41	26	LST	737	28	26
42	27	LST	737	28	26
43	28	LST	737	28	26
44	29	LST	737	28	26
45	56	LST	737	28	26
46	57	LST	834	28	30
47	58	LST	834	28	30
48	59	LST	737	28	26
49	60	LST	737	28	26
50	61	LST	826	28	30
51	3	LPH	903	49	18
52	4	LPH	810	49	17
53	5	LPH	836	49	17
54	36	LPH	780	49	20
55	37	LPH	711	49	19
56	38	LPH	919	49	19
57	39	LPH	804	49	16

Table VII-15

SHIP UNLOADING RATES AND TIMES: ADVANCED LANDING CRAFT
(Run No. 3, 25-nmi Standoff)

	Ship No.	Type	Tons (short tons)	Rate (tons/hr)	Hours
1	30	LKA	3,006	82	37
2	31	LKA	3,031	82	37
3	32	LKA	3,006	82	37
4	34	LKA	1,455	82	18
5	48	LKA	1,653	82	20
6	49	LKA	1,094	82	14
7	33	LPA	644	82	7.85
8	47	LPA	1,722	82	21
9	2	LHA	3,156	84	37
10	2	LHA	3,156	84	37
11	2	LHA	3,156	84	37
12	2	LHA	3,156	84	37
13	7	LPD	1,250	67	19
14	8	LPD	1,299	67	19
15	9	LPD	1,112	67	17
16	10	LPD	1,176	67	18
17	11	LPD	1,031	67	15
18	12	LPD	1,225	67	18
19	41	LPD	935	67	14
20	42	LPD	1,203	67	18
21	43	LPD	1,072	67	16
22	44	LPD	1,251	67	19
23	46	LPD	1,202	67	18
24	13	LSD			
25	14	LSD			
26	15	LSD			
27	16	LSD			
28	17	LSD			
29	18	LSD	Each LSD carried 12 LVTs with 516 troops/LVT; the LVTs were immediately offloaded (not counted in tons/hr rate)		
30	19	LSD			
31	50	LSD			
32	51	LSD			
33	54	LSD			
34	55	LSD			
35	20	LST	783	28	26
36	21	LST	783	28	26
37	22	LST	783	28	26
38	23	LST	783	28	26
39	24	LST	783	28	26
40	25	LST	783	28	26
41	26	LST	783	28	26
42	27	LST	783	28	26
43	28	LST	783	28	26
44	29	LST	783	28	26
45	56	LST	834	28	30
46	57	LST	741	28	26
47	58	LST	741	28	26
48	59	LST	834	28	26
49	60	LST	834	28	26
50	61	LST	834	28	26
51	3	LPH	894	44	20
52	4	LPH	819	44	15
53	5	LPH	669	44	15
54	36	LPH	949	44	22
55	37	LPH	981	44	22
56	38	LPH	980	44	22
57	39	LPH	978	44	22

Table VII-16

UNLOADING RATES FOR CONVENTIONAL LANDING CRAFT
AT A 25-NMI STANDOFF DISTANCE

Ship Type	Rate (ton/hr)
LKA	50
LHA	39
LPD	29
LSD	28
LST	28
LPH	48

In reviewing Tables VII-14 and VII-15, the important fact obtained is that the longest time for unloading is 43 hours for the LHA and 37 hours for the LKA using advanced landing craft at 25-nmi standoff distance. The conventional landing craft run at a 5-nmi standoff distance indicates 34 hours for the longest unloading time. These times would convert to days, depending on the hours unloading crews could be worked and prevailing climatic conditions such as wind, surf, and sea state. If the hours worked were 18, all ships of the force would be unloaded by mid D+3, or 2.39 days. If more hours per day were worked, the days for unloading would be reduced. This information establishes the earliest time for beginning the unloading of AFOE support ships. This data also assumes that combat operations ashore gained control of sufficient terrain to organize the necessary beach and logistic support areas to facilitate cargo handling without undue congestion. As established in a previous paragraph, simulations conducted at SRI to support the landing craft studies of the beach cargo handling operations have verified that the unloading rates determined from the GAMUT simulation can be accommodated at the beach, given the required numbers of vehicles and materiel handling equipment.

a previous paragraph, simulations conducted at SRI to support the landing craft studies of the beach cargo handling operations have verified that the unloading rates determined from the GAMUT simulation can be accommodated at the beach, given the required numbers of vehicles and materiel handling equipment.

The data in Tables VII-15 and VII-16 may be used by amphibious staff planners, along with the results from the CCF Model and the constrained unit T/E lists to determine the most operationally ready force for loading into the available amphibious lift capacity. In an actual operation, having decided to phase various units initially assigned to the AE into the objective area via the AFOE support ships, the commander may find them being landed before D+5, based on the finding of this analysis.

While the unexpected situations that occur in combat may create sufficient confusion in the objective area to negate some of the advantages derived from an application of the results of this study, use of the foregoing techniques nevertheless constitute a powerful aid to the staff planner by constructing the best advanced planning posture from available information.

E. The Effect on Amphibious Lift From Materiel Adjustments

In accordance with the first objective of the study, the impact of new materiel or planned items on the constrained amphibious lift problem will be presented in this section. The description of the research work done to determine materiel adjustments was presented in Section V. Three areas of materiel adjustments were included.

1. New Family of Shelters

The effect on amphibious lift requirements from introducing the new family of shelters into the appropriate troop units of the MAF, as presented in Section V, was found to be a very small increase in bulk and square loaded space. The data from Table V-7 indicated that only .4 percent for bulk and .3 percent for square feet were required to incorporate these items of equipment.

2. Planned Items

Because of the few planned TAM items having embarkation data available, no significant effect on the constrained amphibious lift problem can be determined at this time.

3. Adjusted Mountout Calculations

The analysis of usage data conducted during this study, as presented in Section V, developed adjusting factors for a recomputation of mountout. With the application of these factors within the CCF Model, the mountout in bulk and square feet can be recomputed as though the original combat active replacement factors (CARF) contained in the TAM had been increased to reflect these adjusting factors.

The adjusting factor for the CARF values obtained from the 1968 TAM to be used in the CCF Model is 2.38 for both bulk and square. The constrained amphibious lift problem is then resolved for this new statement of mountout. Figure VII-6 contains the results from this run of the CCF Model.

The 2.38 value for the corrective factor applied within the CCF Model has very little effect on the loading problem. The increase in percent short fall obtained from multiplying 2.38 by the mountout for classes II and VII for each unit was .36 percent, which is insignificant.

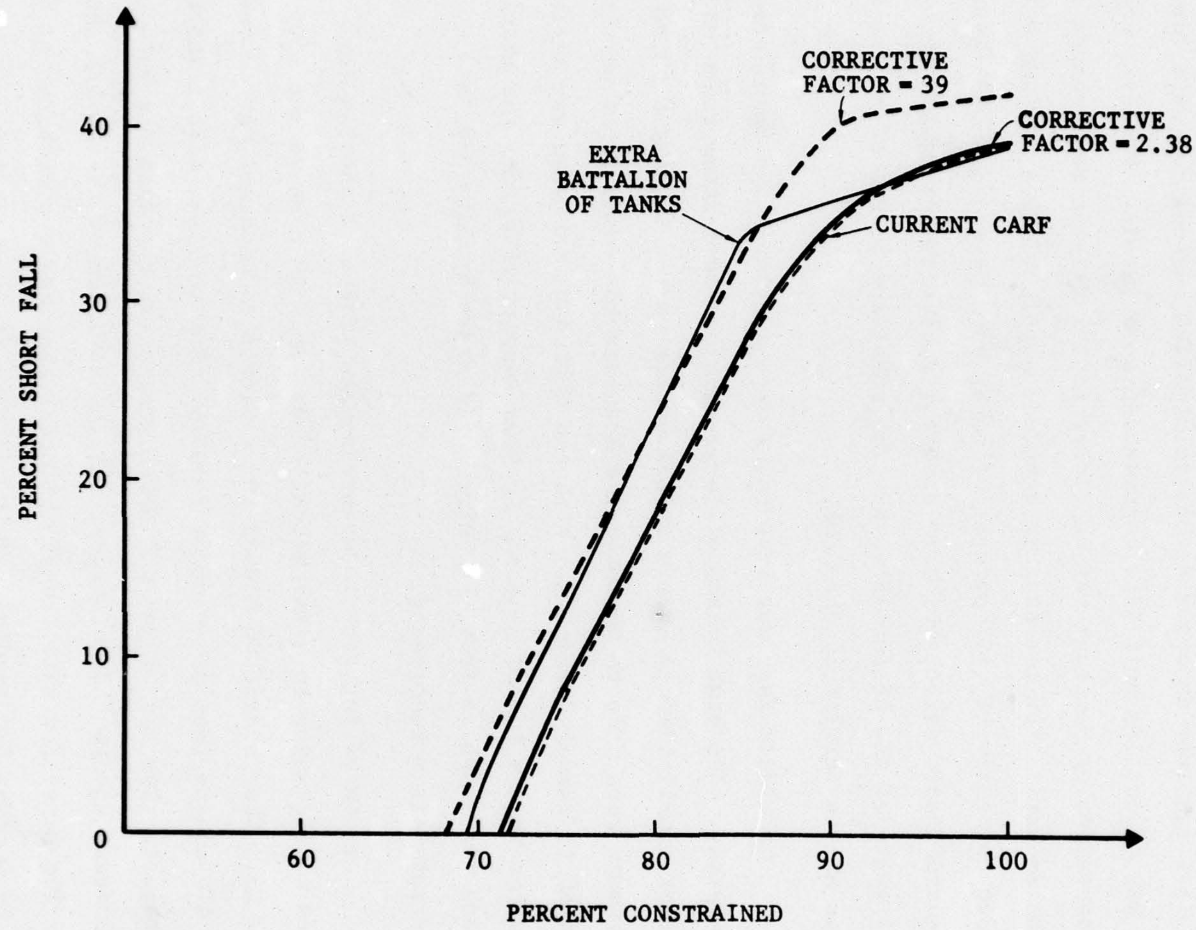

FIGURE VII-6. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR ADJUSTED MOUNTOUT

When using the corrective factor of 39 obtained from Vietnam data for classes II and VII nonsquare, and 1.09 for square loaded items, the unconstrained percent short fall was increased to 42. This jump in total lift requires an applied constraint of 68 percent for unit loading, which may be cutting unit T/Es below acceptable levels. However, this representation of mountout may be closer to a realistic requirement than current amounts. For the assault echelon, supply classes IIW and VIIW mountout currently is .157 percent of total bulk cargo, and .839 percent for square loaded cargo, which is used for replenishment of T/E items in all units of the AE for 15 days. The remaining 45 DOS of mountout for the AE are carried by the AFOE.

No Middle East war loss rates were available for calculations in the study. The high losses of large square loaded items reported from that conflict would have a severe effect on the loading problem if any attempt were made to increase the mountout for these items carried by the AE in assault shipping. With the option of carrying any augmentation for square loaded mountout in AFOE support shipping, the phasing of these items ashore from the ships could start by late D+2, as demonstrated in Subsection E.

It is of interest to determine the effect on the loading problem of including an extra battalion of tanks as part of the mountout in the AE. When adding 66 E1850s and 4 E1860s to mountout, an increase of 20,476 square feet of mountout results. Figure VII-6 also illustrates this result. The run of the CCF Model generating the data for this curve used current mountout data, except for the addition of the 20,476 square feet. The curve for this run of the model requires a constraint of just under 70 percent for loading. This addition of mountout does not have a dramatic effect on the loading problem when considered alone.

It must be pointed out that the adjustment of the troop list for the AE would probably be required to compensate for this increase in mountout, which would permit the use of a higher constraint value for solving the loading problem.

Since the reduction of the CARF values in the TAM during 1972, very little mountout is required by allowances. Commander exceptions to the quantities carried in the TAM may have compensated for the extremely low allowances to some degree. It should also be noted that the CARF values in the TAM are the same for all units regardless of mission. It would appear appropriate to determine the CARF for individual units, and include this data element in the Equipment Allowance File (EAF), rather than the Item Data File (IDF), permitting the value assigned to reflect the unit's mission and expected usage rates.

F. Amphibious Lift Requirements for the Deployed MAB and MAU

The most common force levels requiring embarkation planning are the MAU and MAB. Experience gained from mounting out a MAB for contingency deployments or training exercises consistently reveals the requirement to plan the loading of units into a shipping capacity considerably less than the initially desired lift requirements. A constrained amphibious lift problem exists with these force level organizations as well.

Many cold war operations have found amphibious forces committed to an area via the sea by first landing the forward deployed MAU, quickly reinforced by the parent MAB, and finally brought to MAF strength level at some later time.

This section will present lift requirements of the MAU and MAB obtained from troop lists provided to SRI as part of the MAGTF Project. These requirements will be compared with the assault shipping lift capacities defined for the MAU and MAB in the MMROP. The constrained

amphibious lift problem will be presented for the MAB case. Finally, the lift requirements of the residual MAF from first deploying the MAU/MAB to the objective area will be presented.

1. MAU Lift Requirements

Table VII-17 provides a notional troop list and the lift requirements for a MAU computed from the MAGTF System. The MMROP states that MAU lift requirements would require about 4-7 ships. The lift requirements in Table VII-17 would require about 5 ships, depending on the ship types selected.

2. The Constrained Amphibious Lift Problem of the Notional MAB

Since the MAU is part of the MAB, the lift problem facing the MAB will be considered as including the MAU, even though the MAU may be at a different geographic location initially.

The MAB troop list and lift requirements provided to the MAGTF Project is shown in Table VII-18. A total of 55,398 measurement tons and 582,442 square feet are required for this force. The DOS for mountout was set at 30 for the MAGTF run producing the results. Both the MAU and MAB troop units did not include the new CSS structure with a few exceptions. Some slight reduction in lift may have been possible if the entire troop list had been converted to the new structure. Most of the units contained in this force are detachments and therefore originally tailored to provide a wide range of support functions.

The MMROP states that a force of 16-21 assault ships would be required to lift a notional MAB. Because of the task organized structure of a specifically tailored MAB, this number of ships may be adequate. However, the lift requirements of the notional MAB presented in Table VII-18

Table VII-17

MARINE AMPHIBIOUS UNIT (MAU) TROOP LIST

	Unit	Unit Type Code	Quantity*	MT	PAS	Square	Description
Command Element	M0100U	CCVAA	1	55	75	1355	Hq, MAU Command Element
	M0101U	PGLAA	1	9	11	321	Det SCAMP for MAU
	M0102U	M0102	1	5	8	214	Det Force Recon for MAU
	M0110B	PUBEC	1	35	46	680	Det Radio Bn for MAU/MAB
Ground Combat Element	M1013	0GVAA	4	182	207	0	Inf Co, Inf Bn (Rein)
	M1037	9GUAA	1	570	402	4780	H&S Co, Inf Bn (Rein)
	M0200U	M0200	1	1	4	0	Det Hq Co, Inf Regt for MAU
	M1103	1HMAA	1	559	126	4842	105 How Btry (Rein) D/S Bn
	M0201U	9HLEB	1	9	22	177	Det Hq Btry, D/S Bn for MAU
	M0203U	4HXAA	1	21	43	263	Eng Plt (Rein), Eng Co, Eng Bn
	M0202U	4HVEC	1	1	8	0	Det Eng Spt Co, Eng Bn for MAU
	M0204U	PHSAA	1	11	24	214	Recon Plt (Rein), Recon Co
	M0205U	M0205	1	1	3	0	Det H&S Co, Recon Bn
	M0206U	FJQEB	1	11	9	280	Det Col Plt, C/C Med Bn
	M0207U	2SSAA	1	174	22	1847	Tank Plt (Rein), Tank Co
	M0208U	9SNEC	1	1	5	0	Det H&S Co, Tank Bn
	M0209U	2TYAB	1	52	35	3297	LVT Plt (Rein), Amtrac Co
	M0210U	9TWEB	1	1	7	0	Det H&S Co, Amtrac Bn
Logistic Support Unit	M0300U	M0300	1	340	13	10485	Hq, LSU
	M0301U	9CXAA	1	1	3	0	Det Div Hq, Hq Co, Hq Bn
	M0302U	M0302	1	1	7	0	Det Ser Co (Disb), Hq Bn
	M0303U	QDEC	1	1	7	0	Det MP Co, Hq Bn
	M0204U	PHSAA	1	1	2	0	Recon Plt, Recon Co
	M0305U	UJVAA	1	12	35	0	Trk Plt, Trk Co, MT Bn
	M0207U	2SSAA	1	1	8	0	Tank Plt, Tank Co
	M0307U	FJBEB	1	1	3	0	Det H&S Co, Med Bn
	M0308U	FTFEB	1	1	3	0	Det Dental Co
	M0309U	9JLAA	1	8	29	0	SP Plt, SP Co, SP Bn
	M0310U	9JJEC	1	9	31	0	Det H&S Co, SP Bn
	M0311U	JJEEB	1	33	36	0	Det Sup Co, Ser Bn
	M0312U	HJFEB	1	3	12	0	Det Maint Co, Ser Bn
	M0313U	UJCEB	1	1	6	0	Det Trk Co, Ser Bn
	M0314U	HVRL1	1	1	9	0	Det Ord Maint Co, Maint Bn
	M0315U	HVRL2	1	1	4	0	Det MT Maint Co, Maint Bn
	M0316U	HVRL3	1	1	4	0	Det Elect Maint Co, Maint Bn
	M0317U	JVJE1	1	1	2	0	Det Ammo Co, Sup Bn
	M0318U	JVJE2	1	4	20	0	Det Bulk Fuel Co, Sup Bn
	M0319U	JVJE3	1	1	2	0	Det Sup Co, Sup Bn
	M0320U	JVJE4	1	1	4	0	Det H&S Co, Sup Bn
	M0321U	9VCEC	1	2	9	0	Det Comm Co, H&S Bn
Air Combat Element	M0600U	M0600	1	630	372	9404	Air Combat Element
Naval Beach Party	M0701U	M0701	1	872	142	40913	Naval Beach Party
Total				4171	2441	79072	

*Amount shown is for one (1) unit; multiply by Quantity for total lift requirement.

Table VII-18

MARINE AMPHIBIOUS BRIGADE (MAB) TROOP LIST

	Unit	Unit Type Code	Quantity*	MT†	PAS	Barrels†	Square†	Description
Command Element	M0100B	CCFAA	1	173	225	6	3735	Hq, MAB Command Element
	M0101B	M0101	1	5	17	0	0	Det Div Hq, Hq Co, Hq Bn
	M0103B	PYFEB	1	7	12	1	688	CI Team /-/
	M0104B	PGKAA	1	12	25	0	0	Det SCAMP
	M0105B	VYBEB	1	21	34	1	914	Det Civil Affairs Group
	M0106B	6UHEC	1	43	76	5	1916	Det Comm Bn for MAB
	M0109B	M0109	1	2	4	0	0	Radar Becon Team, Comm Co
	M0110B	PUBEC	1	13	46	1	680	Det Radio Bn for MAU/MAB
Ground Combat Element	M1013	0GVAA	12	159	207	1	0	Rifle Co, Inf Bn
	M1037	9GUAA	3	546	402	9	4742	H&S Co, Inf Bn
	M1096	9GSAA	1	188	184	13	4658	Hq Co, Inf Regt
	M1103	1HMAA	3	536	126	5	4804	105 How Btry, D/S Bn
	M1126	9HLAA	1	250	203	9	7151	Hq Btry, D/S Bn
	M1143	M1143	1	778	126	6	6171	155 How Btry, G/S Bn
	M0201B	M0201	1	3	95	0	1455	Det Hq Btry, G/S Bn
	M0202B	9HEEB	1	411	15	1	278	Det Hq Btry, Arty Regt
	M0203B	1SJGA	1	271	55	2	2128	8" How Plt, 8" How Btry
	M1373	4HWAA	1	102	135	2	799	Engr Co, Engr Bn
	M0204B	4HVEB	1	462	48	11	7113	Det Engr Spt Co, Engr Bn
	M0205B	M0205	1	12	13	0	163	Det H&S Co, Engr Bn
	M0206B	M0206	1	5	6	0	214	Det H&S Co, Recon Bn
	M1423	PHRAA	1	420	85	1	69	Recon Co, Recon Bn
	M0207	PTMAA	1	11	15	0	316	Det Force Recon Co
	M1653	UJUAA	1	63	79	9	8540	Truck Co, MT Bn
	M0208B	M0208	1	5	5	0	61	Det H&S Co, MT Bn
	M4233	2SRAA	1	1111	110	12	7035	Med Tank Co, Tank Bn
	M0209B	9SNEB	1	15	12	0	346	Det H&S Co, Tank Bn
	M4652	2TXAB	1	236	229	39	15846	Amtrac Co, Amtrac Bn
	M0210B	9TWEC	1	2	31	2	1584	Det H&S Co, Amtrac Bn
Logistic Support Group	M0300B	9CKAA	1	9	37	1	414	Hq, LSG
	M0301B	M0301	1	10	32	2	817	Det Comm Bn for LSG
	M0302B	9GDEF	1	7	7	0	0	Det Serv Co (Disb), Hq Bn
	M0303B	M0303	1	5	4	0	0	Det Div Hq, Hq Co (Postal)
	M0304B	QGDEB	1	14	30	1	489	MP Plt, MP Co, Hq Bn
	M1523	FJQAA	1	96	98	4	2869	C/C Co, Med Bn
	M0305B	M0305	1	18	29	4	1532	Det H&S Co, Med Bn
	M0306B	M0306	1	11	19	0	0	Det Hosp Co
	M0307B	M0307	1	10	34	0	0	Det Sup Surg Co
	M0308B	9JBEB	1	216	32	3	1132	Det H&S Co, Serv Bn
	M0309B	HJFEB	1	190	175	9	6310	Det Maint Co, Serv Bn
	M0310B	JJEEC	1	303	119	3	2700	Det Sup Co, Serv Bn
	M0311B	UJCEC	1	70	40	7	6145	Det Truck Co, Serv Bn
	M1863	9JKAA	1	61	66	1	575	Shore Party Co, SP Bn
	M0312B	9JJEB	1	433	78	8	6456	Det H&S Co, SP Bn
	M0313B	M0313	1	17	16	1	800	Det H&S Co, Maint Bn
	M0314B	M0314	1	48	68	2	2396	Det Ord Maint Co, Maint Bn
	M0315B	M0315	1	812	184	35	47690	Det Mt Maint Co, Maint Bn
	M0316B	M0316	1	347	40	30	13721	Det Elect Maint Co, Maint Bn
	M0317B	M0317	1	319	41	15	7910	Det Engr Maint Co, Maint Bn
	M0318B	M0318	1	7	24	0	0	Det Gen Sup Maint Co, Maint Bn
	M0319B	M0319	1	20	16	1	311	Det H&S Co, Sup Bn
	M0320B	M0320	1	72	112	1	297	Det Sup Co, Sup Bn
	M0321B	M0321	1	775	80	7	1154	Det Ration Co, Sup Bn
	M0322B	M0322	1	725	96	6	2085	Det Bulk Fuel Co, Sup Bn
	M0323B	M0323	1	110	78	1	495	Det Ammo Co, Sup Bn
	M0324B	M0324	1	1346	91	4	2530	Det H&S Co, H&S Bn
	M0325B	M0325	1	9	46	1	369	Det Comm Co, H&S Bn
	M0326B	M0326	1	326	66	3	3331	Det Spt Co, H&S Bn
	M0327B	M0327	1	203	88	16	26015	Det Truck Co, H&S Bn
	M4353	4SZAA	1	234	165	10	8927	Engr Co, Engr Bn
	M0328B	9SYEB	1	66	33	4	3221	Det Serv Co, Engr Bn
	M0329B	9SXEB	1	16	22	0	70	Det Hq Co, Engr Bn
	M4252	FTFAA	1	82	71	5	1800	Dental Co
	M0330B	9TQEB	1	12	6	0	153	Det H&S Co, MT Bn
	M4643	UTSAA	1	145	82	10	10250	Truck Co, MT Bn, Force Trps
	M0331B	UTREA	1	34	26	3	5752	Det Transport Co, MT Bn
	M0332B	M0332	1	11	41	4	1766	Det Mar Ter Veh Co, MT Bn

Table VII-18 (Concluded)

	Unit	Unit Type Code	Quantity*	MT†	PAS	Barrels†	Square†	Description
Air Combat Element	M0601B	CLDEB	1	17	7	3	0	Det MWH for MAB
	M0602B	8LPEB	1	120	60	6	3408	Det MWHS for MAB
	M0603B	8MLEC	1	108	77	12	637	Det H&MS, MWSG
	M0604B	8MNEB	1	191	45	46	22223	Det WERS for MAB
	M8631	7LSAA	1	626	271	41	14900	MACS, MACG
	M0605B	7LREC	1	74	62	10	3088	Det MASS, MACG
	M0606B	8LPEC	1	11	20	6	0	Det H&HS, MACG
	M0607B	M0607	1	44	72	2	4368	Det MWCS, MACG
	M0608B	M0608	1	160	102	3	1555	Det FAAD Btry, MACG
	M0609B	M0609	1	592	165	119	8144	Det VMCJ (3 RF-4/3 EA-6A)
	M8813	8NJAA	1	448	484	32	6555	H&MS, MAG (VA/VF/VA (AW))
	M8820	8NKAA	1	4468	479	67	19701	MABS, MAG (VA/VF/VA (AW))
	M8821	7NLAA	2	83	73	6	2181	MATCU, MABS
	M8849	3NMAB	1	2115	320	239	6831	VMFA (12 F-4J)
	M8855	3NSAB	1	3863	227	124	7619	VMA (16 A-4M)
	M8857	3NUAA	1	3526	355	181	9343	VMA (AW) (12 A-6A)
	M8859	3NSAB	1	2896	372	224	6394	VMA (20 AV-8A)
	M8914	SPCAA	1	294	405	7	5522	H&MS, MAG (VH)
	M0610B	3PFEC	1	192	80	7	1636	Det VMO (4 OV-10)
	M8921	SPDAA	1	3145	390	33	17252	MABS, MAG (VH)
	M8937	3PNAA	2	1277	248	48	3591	HMM (18 CH-46E)
	M8944	3PLAA	1	1411	345	92	4488	HMH (21 CH-53D)
	M8964	3PQUA	1	1185	278	33	14503	HML (21 UH-1N)
	M8970	3PUAB	1	1208	303	32	4473	HMA (18 AH-1J)
	M8621	3LYAA	1	333	120	7	6573	Missile Btry, LAAM Bn
	M0611B	8LXEB	1	2212	211	20	14584	Det H&S Btry, LAAM Bn
Naval Support Forces	M0701B	M0701	1	2628	428	0	88184	Naval Beach Group
	M0702B	M0702	1	4894	763	0	53658	Naval Mobile Construction Bn

*Amounts shown for one (1) unit; mulitply by Quantity for total lift sum.

†MT = 55398   Bl = 1831   Sq = 582442

Computed totals have been adjusted for removal of obsolete TAMs.

were processed through CALAS, and an unconstrained lift short fall of 53 percent was obtained when using a 34-ship force, the approximate number of ships in one fleet. In order to analyze the size of the MAB and ascertain what units comprise the cargo, Table VII-19 was prepared. The aviation combat element constitutes 56 percent of the force due to the units providing support for the installation of a SATS site. The Naval Mobile Construction Battalion detachment for a MAB is also included to support construction of the SATS site.

When faced with planning the embarkation of a MAB, the staff planner would proceed to fit the MAB into whatever size ship force was made available, as previously described for the AE of the MAF. After developing the desired troop list based on the information available, he would process this force through MAGTF and analyze the amphibious lift status from the output of CCF Model. Table VII-20 shows the values for the lift short fall for the constraints used. It is obvious from these results that the lift requirement far exceeds the capacity of the 34-ship force, not to mention a short fall from a 21-ship force. A drastic reevaluation of the troop list is therefore necessary. The small effect of applying the constraints in Table VII-20 is due to the large number of detachments included in the list of units. In a case like this, the CFF Model user will probably code certain detachments for application of constraints as well, and allow CALAS to select the optimally constrained operational ready force, but not until he first reduces the troop list. In addition, other means for transporting the large combat aviation element of the MAB would be a possibility.

A run of the CFF Model was conducted by first eliminating the units contained in Table VII-21. The units selected consist of those whose functions may either not be needed immediately, arrive by other transportation means, or be performed in some other way. In any case,

Table VII-19

MAB UNIT CARGO CATEGORIES

Element/Force	MT	Percent of Total	Square	Percent of Total
Command element	276	0.48%	7,933	1.30%
Ground combat element	9,499	16.83	92,565	15.21
Logistics support group	7,189	12.74	170,842	28.07
Air combat element	31,959	56.62	195,341	32.10
Naval support forces	7,522	13.33	141,842	23.31

Table VII-20

WEIGHTED CONSTRAINED UNIT LOADING VS PERCENT SHORT FALL
FOR A NOTIONAL MAB TO BE LOADED IN A 34-SHIP FORCE

Percent Short Fall	Constraint*
53	100
52	90
51	85
50	75
49	70
48	65

*Constraints are weighted according to a unit's mission, as explained in Section VI.

Table VII-21

UNITS SELECTED FOR REDUCED MAB TROOP LIST

Unit	MT	Sq
M0321B	775	1,154
M0323B	110	495
M0324B	1346	2,530
M0316B	347	13,721
M0315B	876	47,690
M8820	4468	19,201
M8821	166	4,362
M8914	294	5,522
M8921	3145	17,252
M8621	333	6,573
M0702B	4894	53,658

the logistics planner will make his selection from the best information available. Figure VII-7 presents the results of constrained loading using the reduced MAB troop list. The relatively flat slope of the curve is due to applying constraints to essentially a small number of units. The planner could increase the number of units, i.e., detachments, and spread the T/E reductions through more units, or he could make greater reductions in the troop list.

3. Follow-on Deployment of the MAF

The residual units of the MAF requiring lift to proceed to the objective area of the deployed MAB would depend for the most part on turnaround assault shipping, airlift, or common user sealift. A notional residual force was constructed by the project team. Totals for this force are listed in Table VII-22. The troop list and unit lift requirements for the AE are listed in Table VII-23. These values are based on computing mountout for 15 DOS.

4. The MAB Embarked in SMLS Configured Assault Shipping

The possibility exists that the MAU and MAB may deploy configured for Seaborne Mobile Logistic Support (SMLS). The loading problem when considering ships prepared for SMLS support becomes more constrained due to the loss of cargo space for landing force materiel. The Marine Corps study of SMLS[4] indicates that six ships would be configured for SMLS support functions. Estimates of loading these ships reveal that broken stowage factors would be reduced from 0.8 to 0.5. A MAB configured for SMLS support would have an altered troop list that eliminated certain units and functions from deploying ashore. The troop list in Table VII-21 containing units to be deleted from the MAB include maintenance detachments. The results from the altered MAB troop list run of the CCF Model could be reduced even further if justified by the expected situation facing the SMLS configured MAB.

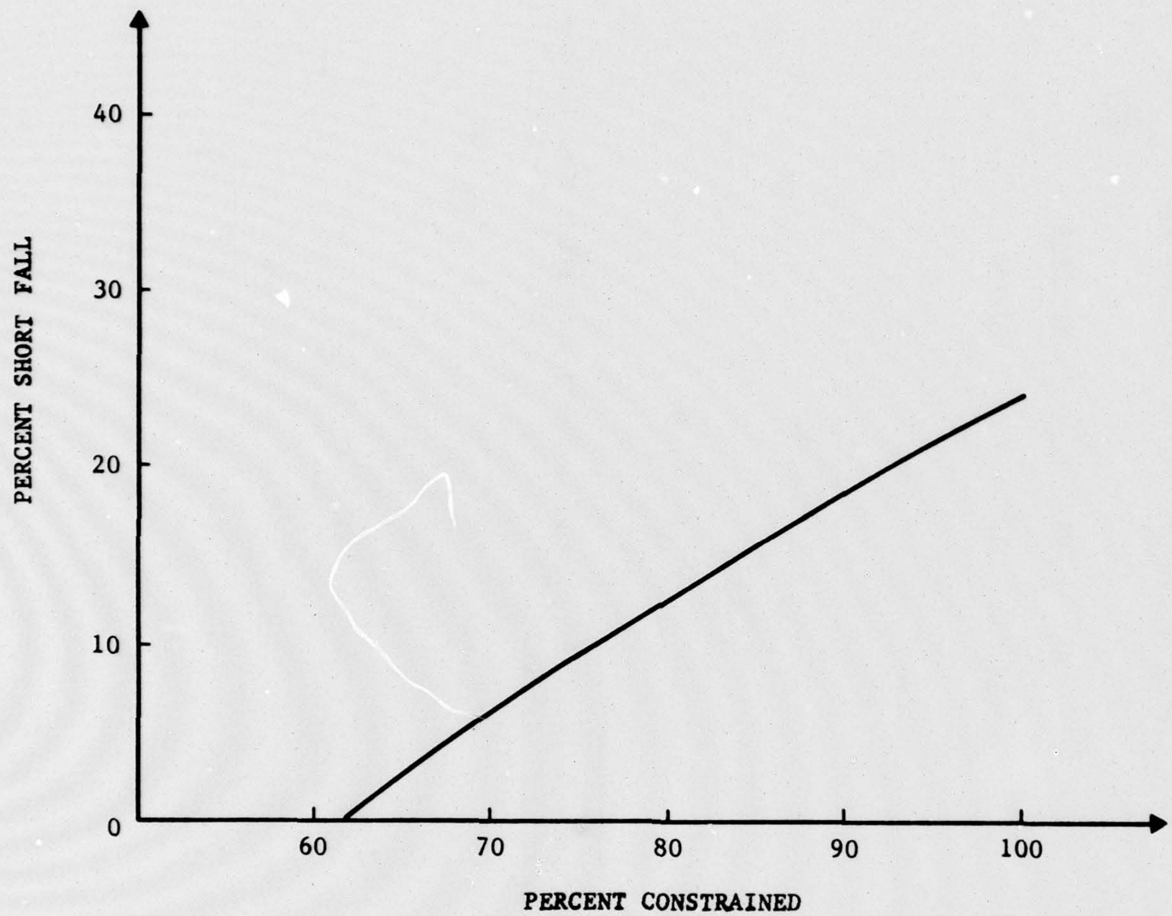

FIGURE VII-7. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR THE MAB REDUCED TROOP LIST WITH 34 SHIP FORCE

Table VII-22

LIFT REQUIREMENTS FOR THE RESIDUAL MAF

MT	Total MT*	Square Feet
58,000	183,544	660,760

AFOE

MT*
306,036

*This figure includes the cube of square loaded items when loading in common user sealift.

Table VII-23

FOLLOW-ON RESIDUAL ASSAULT ECHELON OF MAF

Unit	Quantity*	MT†	PAS	Barrels†	Square†
M4623M	1	1805	161	824	500
M1096	2	188	184	491	6344
M1038	6	1018	1230	453	4748
M1128	2	1733	707	1170	28184
M4233	2	914	110	453	6383
M1423	3	449	85	19	131
M1373X	3	72	121	75	1105
M4652	3	111	229	1491	15414
M1864X	1	389	244	755	12732
M0701F	1	6482	914	66	2701
M1196	1	981	278	1208	17502
M1363X	1	2747	202	1830	31463
M4237	1	867	313	774	16966
M4903	3	35	120	38	610
M4907	1	96	182	358	6346
M3857X	1	457	287	1245	11044
M3853X	3	59	103	113	1916
M1427	1	116	130	283	6522
M8625X	1	209	278	208	3669
M1988	1	740	1040	925	17591
M1377X	1	130	131	94	794
M1867X	1	263	173	340	6614
M4654	1	227	253	943	11628
CMD-GP	1	1688	1566	3931	85570
M8612X	1	399	388	1283	16658
M8631X	1	1068	244	2302	13867
M8640X	1	337	197	943	7998
M8615X	1	198	158	302	2893
M8937X	1	1217	241	1811	3189
M8943X	2	1291	298	3057	3927
M8964X	1	1109	269	1245	2789
M8968X	1	1333	217	1472	3879
M8859X	1	2001	363	8642	5464
M3447F	1	113	337	358	5832
M3343F	1	10	136	19	427
M3313F	1	2954	140	0	22677
M3323F	1	8	47	19	458
M3442F	1	1111	202	472	11201
M1985X	1	89	143	415	12616
M0601F	1	35	212	0	0
M0604F	1	668	257	906	11024
M4112	1	673	225	736	14584
M4193	2	425	177	528	10581
M4201	1	67	120	170	2035
M4226	1	678	177	528	8730
M3223X	1	621	280	491	11365
M3233F	1	43	125	57	1455
M3247F	1	127	55	38	1975
M3243X	1	1043	191	189	7188
M3253X	1	234	190	75	2763
M0305F	1	212	120	736	11914
M0307F	1	24	82	38	571
M3751X	1	2224	315	755	7909
M3753X	1	1034	144	434	8955
M8914X	2	183	359	189	4839
M8921	1	3245	390	1283	17374
M8821	2	87	73	208	2198

*Amounts Listed are for one (1) unit; multiply by Quantity for total lift requirement.

†MT = 58000 Bl = 59621 Sq = 660760
Computed totals have been adjusted to remove obsolete TAMs.

G. Assault Follow-on Echelon Lift Requirements

AFOE troop list and lift requirements are listed in Table VII-24. This list shows the cargo configured for loading in common user sealift. The mountout is computed for 60 DOS and includes 45 DOS for the AE. An increased lift requirement for materiel eliminated from the AE for constrained loading is included. The study was not vitally concerned with the AFOE lift requirements beyond establishing if a shipping constraint would exist for this materiel as well.

1. Commerical Ship Assets

Research was conducted into common user sealift assets that may be available to lift a notional AFOE force. Information obtained[3] indicated that over 60 commercial ships, on the average, are less than six days from the ports of embarkation usually used by Marine Corps units. While time must be allowed for ship unloading before they are available for loading AFOE units, sufficient time appears to exist for meeting a 30-day warning period to sailing date. Since the availability of these ships depends on decisions made at the highest national level, no speculation on ship availability is presented here. Table VII-25 presents a list of ship capacities obtained from data supporting the study in Reference 3 to illustrate ship capacities with respect to AFOE lift requirements. Approximately 24 ships from this list are needed to lift the AFOE.

2. Common User Sea Lift Notional Ship Planning Data

Planning data obtained from NAVMAT P4000-2 provides the notional lift characteristics for common user sealift assets. Table VII-26 gives an analysis of the notional AFOE lift requirements with respect to common user sealift characteristics. The data for passenger ships includes

Table VII-24

CSS AFOE LIFT REQUIREMENTS

Unit	Quantity*	MT†	Pas	Barrels†	Unit Descriptor
M4722	1	154	16	2	CI Team
M4392	1	561	53	8	TOPO Plt
M0602F	1	30	66	0	Det Hq, MAW
M8620X	1	5456	325	79	H&S Btry, LAAM Bn
M8621X	3	722	115	27	Missile Btry, LAAM Bn
M8710X	1	3967	515	95	H&MS, MWSG
M8715X	1	50303	503	139	Trans Sqdn
M8714X	1	41585	377	116	Engr Sqdn
M3755N	1	21281	253	103	Engr Spt Co, Engr Spt Bn
M3751X	1	3550	315	41	Bulk Fuel Co, Engr Spt Bn
M3752X	1	7258	139	12	Bridge Co, Engr Spt Bn
M3851X	3	517	71	9	Dental Co
M4903	1	194	120	3	MP Co, MP Bn
M4643N	1	24526	264	67	Trk Plt, Trk Co
M4644X	1	31014	238	57	Trans Co, MT Bn, FSSG
M4647X	1	3302	156	26	H&S Co, MT Bn, FSSG
M3853X	1	331	103	6	Med Co, Med Bn, FSSG
M3854X	1	253	239	7	Hosp Co, Med Bn, FSSG
M3753X	1	5629	144	24	Engr Co, Engr Spt Bn
M3233N	1	3478	158	12	Det MT Maint Co
M3247N	1	5839	152	63	H&S Co /-/ Maint Bn
M3313N	1	527	405	10	Supply Co /-/ Supply Bn
M3323N	1	1349	142	5	Ration Co /-/ Supply Bn
M3343N	1	1661	268	10	Ammo Co /-/ Supply Bn
M3347X	1	2113	379	33	H&S Co, Supply Bn
M3443X	1	1311	375	17	Comm Co, H&S Bn, FSSG
M3447N	1	3498	521	66	H&S Co, Supply Bn
M3442N	1	3861	388	38	B&P Co, H&S Bn
M3444N	1	448	179	6	MP Co, H&S Bn, FSSG
M3445N	1	392	268	4	Svc Co, H&S Bn, FSSG
M0702	1	388	763	0	Mobile Const Bn
M0603F	1	13	4	0	Det Hq, MAW
M8712	1	224	4	2	MWWU
M8652	1	2833	122	625	VMCJ (7 RF-4/17 EA-6)
M8780X	1	2184	419	634	VMGR (12 KC-130)
M8813X	3	1515	449	13	H-MS MAG (VA/VF)
M8855	2	7598	227	265	VMA (20 A-4)
M8857X	2	6632	347	382	VMA (AW) (12 A-6A)
M8848X	4	3634	377	650	VMFA (15 F-4J)
M0605F	1	643	77	5	Det MWHS

*Amount shown is for one (1) unit; multiply by Qty for total lift requirement)

†MT = 281,414   Barrels = 6,356

Table VII-25

COMMERCIAL SHIPS AVAILABILITY AND CAPACITY

	Ship No.*	Days†	Speed	MT
1	6646	1	16.0	18,400
2	8703	2	20.0	16,284
3	10703	2	20.0	19,233
4	30603	2	20.8	27,055
5	30044	1	23.0	20,441
6	29781	2	21.0	27,050
7	9743	2	20.0	16,275
8	29734	2	23.0	20,441
9	6949	2	20.0	15,850
10	22543	2	20.0	14,586
11	15492	1	16.0	20,268
12	6682	1	17.0	18,792
13	6686	2	17.0	28,631
14	11690	2	16.0	18,639
15	11098	1	17.0	31,789
16	60335	2	23.0	25,672
17	32600	2	21.5	34,100
18	31227	1	23.0	44,690
19	37720	2	23.0	25,672
20	62809	2	23.0	44,609
21	63822	2	23.0	35,000
22	63823	1	23.0	35,000
23	30170	2	23.3	38,473
24	11109	2	17.0	19,000
25	21814	2	20.0	13,643
26	28595	2	20.0	23,670
27	13176	2	16.5	19,825
28	11681	2	16.5	19,825
29	6670	3	16.0	18,400
30	6671	3	16.0	18,400
31	5637	3	15.5	24,847
32	11114	3	17.0	18,792
33	37792	3	32.8	58,375
34	27617	3	22.0	32,395
35	33964	3	22.5	41,415
36	22392	4	20.0	18,443
37	21451	4	20.0	19,425
38	25928	4	21.0	18,300

Table VII-25 (Concluded)

	Ship No.	Days	Speed	MT
39	11107	4	17.0	15,107
40	60474	4	33.0	58,375
41	22235	4	20.0	16,072
42	60472	5	33.0	58,375
43	30008	5	22.0	33,275
44	13589	5	20.0	27,591
45	29197	5	22.0	33,275
46	31820	5	23.0	44,690
47	28726	5	23.0	29,315
48	62810	5	23.0	44,609
49	62808	5	23.0	44,609
50	61691	5	22.0	43,388
51	36051	5	22.5	41,415
52	35880	5	22.5	41,415
53	37282	5	22.5	41,415
54	11676	5	16.5	19,825
55	27454	6	20.0	18,747
56	25039	6	20.0	18,747
57	11668	6	16.0	17,330
58	11119	6	17.0	31,789
59	60602	6	20.0	16,072
60	38082	6	33.0	58,375

*Source: Project SEA EXPRESS[5].

†Sailing days from U.S. (USMC access) ports.

Table VII-26

AFOE LIFT REQUIREMENTS

Passengers	=	13,011
Measurement Tons, Cargo	=	306,036
Barrels of Bulk Fuel	=	635,600

Notional Ships Required

Passenger Ships	=	9
Cargo Ships	=	40
Tankers	=	3

2000 MTs of cargo, in addition to the troop lift capacities. On the basis of this planning data, a group of 52 ships would be required to lift the AFOE.

In general, the fly-in echelon of the AFOE would require sealift for only half of the computed cargo for those units of the fly in echelon in Table VII-24. Cargo reductions for the airlift portion of these units could be accomplished if a detailed loading analysis was desired.

3. Containerization

The problems of loading AFOE cargo into containers for lift by container ships will become a problem in the 1980s. Containers were not considered in this study due to the emphasis placed on the assault echelon by the study objectives. It is of interest to note that the MAGTF System is capable of determining cargo suitable for containerization when the need should arise.

I. Summary

The materiel presented in this section has demonstrated the use of CALAS to solve the constrained amphibious loading problem using a systematic computerized mathematical methodology. The solution procedure included the exercising of various options available to the user of the system. These options include the use of system features that reduce the AE either by (1) horizontal cuts, i.e., reducing the unit's T/E by a series of constraint values or by reducing the DOS for mountout; by (2) vertical cuts, i.e., reducing the troop units of the force from those to be loaded into assault shipping; or (3) by a combination of both options. The effect of varying input from the possible need to increase the statement of mountout to be carried by the AE of the MAF on the constrained amphibious lift problem was also presented.

The effect of combining these options on the constrained lift problem is demonstrated in Figure VII-8, where the following options were exercised:

(1) Modified troop list

(2) Increased mountout from Vietnam data and an extra battalion of tanks

(3) Weighted application of constraints to unit T/Es.

The CCF model run using these options provides data indicating that a 78 percent T/E reduction in combination with the first two options was necessary to load the available ships. If these ships quantities are reduced due to breakdown or enemy action, a greater loading problem will exist.

The feasibility of vertical cuts of the AE, which are really units designated for phased entry into the objective area from the AFOE support ships, were shown to be dependent on the unloading times necessary for the assault shipping. Simulation results showed that only a 2- to 3-day delay may be required before phased units are landed and deployed ashore.

The application of CALAS to the constrained loading problem of the MAB was also provided. The magnitude of the constraints necessary to load the MAB was shown to be dependent on the size of the force structure selected for the MAB. The supplies and equipment to accompany the notional troop list for the MAB obtained from the MAGTF Lift Model resulted in lift requirements too large for a 34 ship force.

The lift problem for the AFOE was shown to exist without the need to apply CALAS. Sufficient ships from the common user sealift pool exist to lift this force. The need for timely arrival at the objective area to begin unloading when crews and landing craft are available cannot be over emphasized. This facilitates the rapid phasing ashore of originally designated AE units.

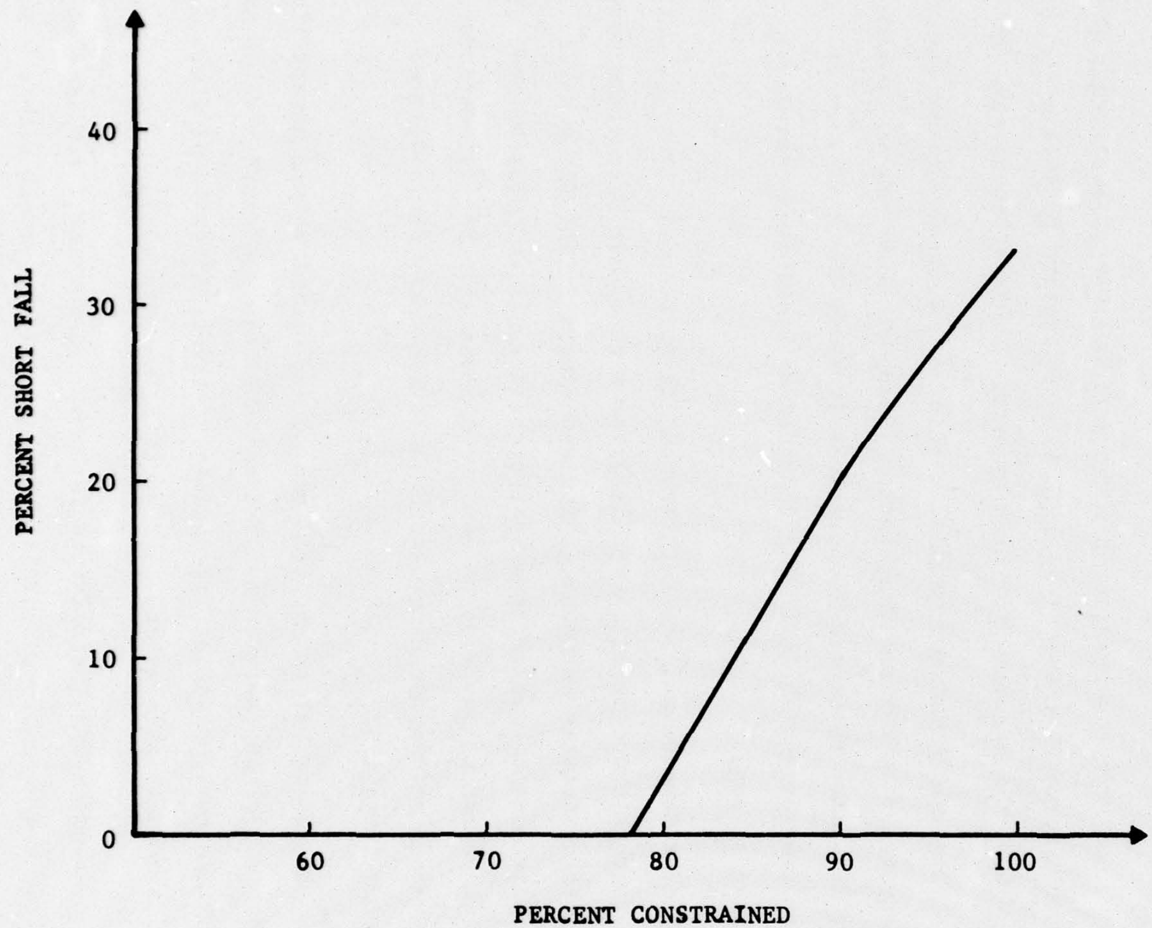

FIGURE VII-8. WEIGHTED CONSTRAINED UNIT LOADING VERSUS PERCENT SHORT FALL FOR MODIFIED TROOP LIST AND MOUNTOUT INCREASE FROM VIETNAM DATA AND EXTRA TANKS

J. Conclusions

The analysis conducted in this section has provided support for the conclusions presented herewith. The subsections from which these conclusions derive are indicated.

1. The lift requirements for the notional MAF AE are larger than can be satisfactorily reduced by applying constraints to full units in order to fit into assault shipping capacity. (Subsection B, page 28.)

2. The use of CALAS installed within an automated command and control system provides the computational support necessary to systematically determine the optimal operationally ready force in a short period of time during the planning phase of an amphibious operation. (Subsection B, page 2.)

3. The Constrained T/E Embarkation Analysis Model using the criticality factors denoting all items importance to a unit's function provides a practical systematic methodology for reducing a unit't T/E when its lift requirements must be constrained by limited assault shipping assets. This analytical procedure may also be used to compute lift requirements for airlift when a percentage reduction of unit T/E materiel is desired. (Subsection B, page 7.)

4. An assessment of the time phased deployment ashore possibilities for combat and combat service support units within the MAGTF Mission provides the greatest potential for optimizing the utilization of limited amphibious assault ship assets. (Subsection C, page 29.)

5. Based on GAMUT simulation results, the potential for landing the AE from the amphibious assault force used in this study within 3 days is a real possibility. (Subsection D, page 46.)

6. Units may begin unloading from AFOE support ships from D+2 on. (Subsection D, page 46.)

7. The unloading rates simulated by GAMUT can be supported by unit's handling cargo transfer operations at the beach. (Subsection D, page 47.)

8. The statement of mountout for supply classes IIW and VIIW computed from current combat active replacement factors (CARF) may be inadequate to support future expected combat losses. (Subsection E, page 51.)

9. The practice of using the same value for CARF for mountout calculations regardless of the different missions of units in the force results in an inadequate statement of mountout or prepositioned war reserve materiel. (Subsection E, page 51.)

10. Significant amphibious lift short falls will exist when attempting to load a MAB whose troop list is the size of the notional MAB into a 34-ship force, and, to a greater extent, a 21-ship force. (Subsection F, page 51.)

11. Sufficient ships are available to lift the AFOE of the MAF from common user sealift assets. (Subsection G, page 69.)

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VIII A WEIGHT AND CUBE CONTROL PROGRAM

A. Requirements

The third objective of the research study reported on herein is to determine the actions necessary to establish a viable weight and cube control program for landing force materiel. The purpose of this program is to ensure that lift requirement considerations be given major attention during the materiel acquisition process.

B. Background

For many years materiel acquisition programs have been the subject of continuing analysis, review, and evaluation. The addition of complex and expensive systems and materiel has continued to increase significantly, to a point where major improvements in the Marine Corps' Materiel acquisition process are essential if operational readiness is to be maintained within the constraints of projected scarce resource levels.

A reduction in the number of naval ships dedicated to amphibious operations has seriously constrained the amount of amphibious lift of the assault echelon (AE) of the MAF. Therefore, it is important that, early in the acquisition process, individual systems or items of materiel be subjected to a logistic supportability evaluation. Such evaluations should be based not only on the direct effects the addition, removal, or replacement of new items of materiel have on the total weight, square, and cube of landing force materiel, but also on the secondary effects of fuel consumption, repair parts, and personnel requirements.

C. Areas of Emphasis

The Marine Corps' acquisition process emphasizes the need for simulating, modeling, and prototyping the proposed items of materiel to demonstrate their overall effect on the Fleet Marine Force. Early application of integrated logistic support principles is stressed in the acquisition procedure.

D. Major Materiel Acquisition Phases

Normally, an item of materiel slated for introduction into the Marine Corps progresses through the four following phases after the decision to consider the item for acquisition has been initiated:

(1) Conceptual phase

(2) Full scale engineering development phase

(3) Production/procurement phase

(4) Development and support phase.

Insofar as new equipment development is concerned, the most important phase for weight and cube considerations is the conceptual phase. Here exploratory and advanced development constitute the main areas of investigation. At this stage of development, the new item will be sufficiently defined to establish weight, dimensional data, and operating characteristics, such that estimates of fuel requirements and repair part usage may be established.

The CG MCDEC is the principal agent for the CMC in executing the "conceptual phase." He is responsible for advising the CMC of the results derived from this phase and for recommending the systems and items of materiel that have potential application to the Marine Corps' operational needs.

It logically follows that the CG, MCDEC would be a primary user of a weight and cube control program.

E. MAGTFs Role in the Materiel Acquisition Process

Program MAGTF is ideally designed to play a major role in the "conceptual phase" of the materiel acquisition process. Already included in the data base is the majority of the information needed to determine the effects of new materiel acquisitions upon lift requirements. The MAGTF data base contains the T/Os and T/Es for all standard and nonstandard Marine Corps units. As explained in section V, the data base contains physical characteristics of each T/E item. Therefore, it becomes a relatively simple procedure to structure notional MAFs, MABs, and MAUs to conform to MMROP and MLRP troop lists and to determine the overall effect on the amphibious lift requirements of the MAGTF of interest. Equally simple is the addition, deletion, or replacement of items within a unit's T/E and the alteration of their physical characteristics within the MAGTF data base for restructuring the unit.

A notional organization such as a MAB or MAU can be processed through the MAGTF system first with its existing T/E, and then with the same T/E altered to reflect the addition, deletion, or replacement of items. The impact of these alterations upon the overall cube, square, and weight of the organization can be made by comparing the two runs. In addition, the secondary effects, such as fuel consumption, repair part consumption, replacement quantities, and personnel changes, can be examined from the output listings of Program MAGTF.

The following discussion is a step-by-step description of how the MAGTF System was utilized to provide a comparative analysis and evaluation of replacing existing shelters and shelter transport in a notional MAF with a new family of shelters, along with the transport utilized to convey the new shelters. The principal findings from this analysis will be the overall effect the shelter replacement has on the total cube, square, and weight of the MAF.

This analysis is presented to show the role that Program MAGTF can play in both the "conceptual phase" of the materiel acquisition process and in a weight, square, and cube control program. Section V has already covered the results of this effort.

1. Updating MAGTF SYSTEM and EQUIP Files

Before Program MAGTF could be utilized for the comparative analysis, it was necessary to obtain the physical characteristics of the new shelters, the new logistic trailers, and the new 6-ton truck tractor.

Once these physical characteristics were obtained, VALU cards were prepared, containing this dimensional data, then the MAGTF EQUIP file was updated. The next step was to update the SYSTEM File with the new equipment. In the cases of the new shelters, the individual systems to be added consisted of only each individual new shelter. However, in the case of the new truck tractor, the new system to be added included not only the truck tractor but also fuel, lube, and grease consumption rates, as well as class IX usage rates.

After updating the SYSTEM and EQUIP Files, Program CREATE was run to place this new data on the randomly accessible files to be read by Program MAGTF.

Figure VIII-1 is an illustration of the new family of proposed Marine Corps shelters, logistic trailers, and truck tractors.

2. Shelter Replacement Allowances

A table of shelter replacement allowances showing for each existing shelter the type and quantity of the replacement shelter(s) was constructed. Table VIII-1 is an extraction from that table. When replacing existing hard shelters it was sometimes necessary to replace one existing shelter with two or more replacement shelters to ensure equivalent square foot work space availability.

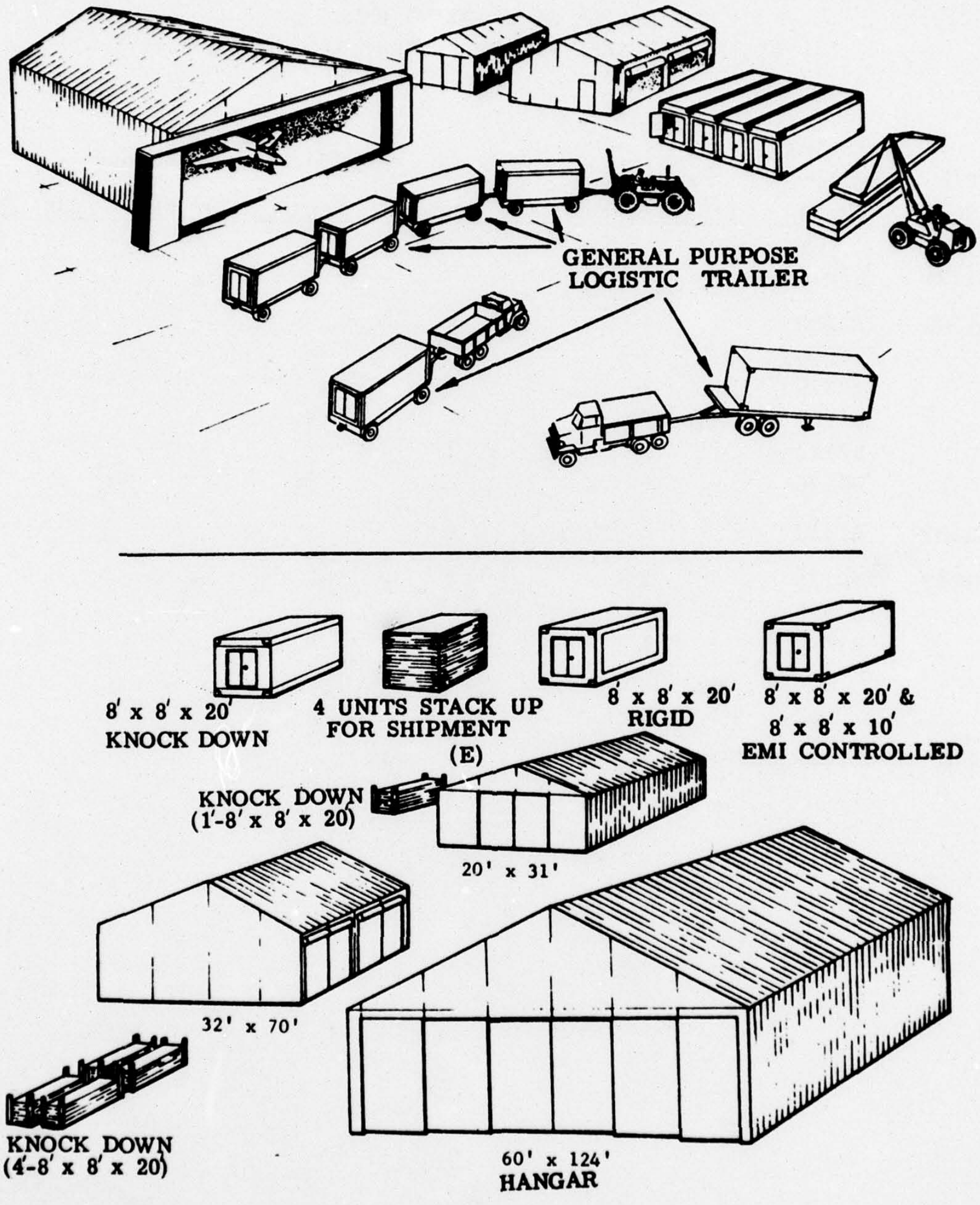

FIGURE VIII-I. PROPOSED FAMILY OF SHELTERS AND TRANSPORT

Table VIII-1

SAMPLE OF EXISTING HARD
SHELTER/NEW SHELTER REPLACEMENT ALLOWANCES

T/E No.	Existing Shelter TAM No.	Existing T/E Allowance	Replacement Allowance Knockdown	Rigid	20' EMI*	10' EMI*
M1126	E1036	1		2		
M1743	A2320	4				4
	A2340	2				2
	A2350	2				2
	B1960	1		1		
	B2595	1	1	2		
	D0270	4		8		
M4392	B1312	2	4	6		
M3253	A0175	2				4
	A2696	1			1	
	E1038	1		1		

*EMI=electromagnetic isolation

Table VIII-1 is an example of how the replacements are made for existing shelters. For example, unit M1126 has a T/E quantity of one E1036, a meteorological station, that is to be replaced by two of the new rigid shelters.

3. Transport Replacement Allowances

In determining the new logistic trailer replacement allowances, the rule of one trailer per five shelters was followed. The ratio of one truck-tractor per one and one-half logistic trailers was followed in determining the quantity of new 6-ton truck-tractors that would be needed to convey the new shelters.

A table (not shown) similar to Table VIII-1 was constructed, showing the transport replacement allowances for each T/E transport item affected by the addition of the new shelters.

4. Unit-by-Unit Replacement of Existing Shelters with New Family of Shelters

A unit-by-unit, shelter-by-shelter worksheet was prepared to tally the replacement of existing shelters with the new shelter replacements. The worksheet was divided into two sections: one for the assault echelon and one for the assault follow-on echelon. Totals for each type of shelter to be removed, as well as totals for each type of replacement shelter, were obtained. Table VIII-2 shows a portion of the worksheet.

5. Unit-by-Unit Replacement of Existing Transport with New Transport

Included in Table VIII-2 are quantities of the TAM items of transport to be deleted from a unit's T/E, along with the replacement quantities of trailers and 6-ton truck-tractors.

Table VIII-2

SAMPLE
UNIT-BY-UNIT REPLACEMENT ALLOWANCES FOR EXISTING HARD SHELTERS AND TRANSPORT WITH NEW SHELTERS AND TRANSPORT

	Replacement Allowances						Existing Allowances									
	LOG TRLR	TRK-TRAC	KNOCK-DOWN	RIGID	10' EMI	20' EMI	B1460	B1950	B1960	B2595	C6410	C6440	D0310	D0320	E1660	E1670
Assault Echelon																
CMD-ELEM	8	7		4	65											
M8921	1	1											1	1		
M1743	6	4		25	8				1	2			2	2	2	
M0303F					4											
M1867					1											
M3223	4	2		18											2	
M3253	4	2		3	22	1										
M8621	1	1			1	1										
M8821	1	1			2											
M8615				3									1	1		
M8631	10	6			36	3										
TOTAL AE	42	28	6	69	169	5		1	2	2			4	4	4	
AFOE																
M4392			4	6												
M8820	4	2	3	12	3								3	3		
M8620	5	3	2		11	9										
M8621					2	2										
M8710	4	2	8	14	2											
M8715	2	1	2	10						1			1	1		
M8821	1	1														
M0306F					5				1							
M3213				2								2				
M0313F	5	3	1	12									3	3		
TOTAL AFOE	26	14	20	80	24	11			1	1		2	7	7		
TOTAL MAF	68	42	26	149	193	16		1	3	3		2	11	11		

6. MAGTF Input

Two approaches were possible in using Program MAGTF for the shelter analysis. The first approach was to run the assault echelon and then the assault follow-on echelon of the MAF with the existing shelters, and then rerun each echelon with the existing shelters and transport deleted and the new shelters and transport included. The big disadvantage to this approach was the long running time and the larger expense of running a full MAF-sized problem through MAGTF.

The second approach was to prepare separate runs; the first for the additions to, and the second for the deletions from each of the echelons of the MAF, and then perform a simple subtraction to obtain the net effect the introduction of the new set of shelters would have on the square, cube, and weight of the assault echelon and the assault follow-on echelon of the MAF.

Table VIII-3 is a partial listing of the MAGTF input data deck for each of the four MAGTF runs that were necessary to perform this analysis.

7. MAGTF Output

Tables VIII-4, 5, 6, and 7 contain examples of the output of Program MAGTF. Although the results of all four runs were used for the analysis, only a small portion of the output from one run is shown.

The reader can see that the total class VII square computed using the existing shelters and transport shown at the bottom of Table VIII-4 is 32,097 square feet. Comparing this number with the result of the run (not shown) using the new replacement shelters and transport, an increase is found of about 8,500 square feet obtained by introducing the new shelter system into the assault echelon.

Table VIII-3

MAGTF INPUT DATA CARDS FOR
EXISTING/REPLACEMENT SHELTER ANALYSIS

Run 1

BASIC UNIT NAME	=	SHELTER-AE	Existing Shelter and Transport Deletions
SYSTEMS	=	1 A0010	
SYSTEMS	=	2 A0060	
SYSTEMS	=	2 A0175	
.			
.			
.			
SYSTEMS	=	3 E1730	
ASSAULT ECHELON UNIT	=	SHELTER-AE	
STOP			

Run 2

BASIC UNIT NAME	=	SHELTER-AFOE	Existing Shelter and Transport Deletions
SYSTEMS	=	5 A0270	
SYSTEMS	=	1 A1110	
.			
.			
.			
SYSTEMS	=	1 E1790	
ASSAULT ECHELON UNIT	=	SHELTER-AFOE	
STOP			

Run 3

BASIC UNIT NAME	=	NEW-AE-SHELTERS	New AE Shelter and Transport Additions
SYSTEMS	=	45 NEWLOGTRLRS	
SYSTEMS	=	83 NEW SHLTR-RIGID	
.			
.			
.			
ASSAULT ECHELON UNIT	=	NEW-AE-SHELTERS	
STOP			

Table VII-3 (Concluded)

MAGTF INPUT DATA CARDS FOR
EXISTING/REPLACEMENT SHELTER ANALYSIS

Run 4

BASIC UNIT NAME	=	*NEW-AFOE-SHELTERS*
SYSTEMS	=	20 NEWSHLTR-KNOCK
.		
.		
.		
ASSAULT ECHELON UNIT	=	NEW-AFOE-SHELTERS
STOP		

New AFOE Shelter and Transport Additions

Table VIII-4

INITIAL ISSUE OF MAJOR EQUIPMENT FOR SHELTER-AE

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	SQ FT	LBS	NML	******CARGO****** CU FT	LBS
WEAPONS(CLASS VIIW)									
OTHER CLASS VIIW (T/E TYPE 1)									
	A0010	06743A	AIRBORNE-MOBILE DIRE	1.	88.	4400.	NO	0.	0.
	A0060	06745A	AIR SUPPORT RADAR TE	2.	176.	10800.	NO	0.	0.
	A0175	04294B	CALIB COMPLX, TRNSPT	2.	0.	0.	NO	0.	0.
	A0175A	04294R	SHELTR NO 1, CALIB C	2.	236.	16000.	YES	0.	0.
	A0175B	04294R	SHELTR NO 2, CALIB C	2.	236.	16000.	YES	0.	0.
	A0177	07507A	CALIBRATION SHOP,TRA	1.	80.	6150.	NO	0.	0.
	A0240	05921A	CENTAL OFFICE TELEPH	2.	0.	0.	NO	0.	0.
	A0240A	05921A	TEL SB AN/MTA-3, CEN	2.	160.	7280.	YES	0.	0.
	A0240B	05921A	TEL TERMINAL GRP, CE	2.	164.	8920.	YES	0.	0.
	A0270	02968A	COMMUNICATIONS, CENT	17.	697.	33575.	YES	0.	0.
	A0280	04165A	COMMUNICATIONS CENTR	4.	320.	17100.	YES	0.	0.
	A0540	03841A	DIRECTION FINDING PL	1.	58.	3040.	YES	0.	0.
	A0625	06615A	ELECTRONIC MONITOR A	4.	328.	34800.	NO	0.	0.
	A0860	03844R	INTERCEPT FACILITY H	4.	356.	15840.	YES	0.	0.
	A0865	07306A	LIGHT INTERCEPT FACI	8.	384.	14400.	NO	0.	0.
	A1350	01435A	RADAR, COURSE DIRECT	3.	132.	10500.	YES	0.	0.
	A1460	02466A	RADAR SET, AN/TPS-22	1.	0.	21500.	YES	0.	0.
	A1507A	02393D	VAN, RADAR SET AN/UP	1.	79.	4500.	YES	0.	0.
	A1660	03842A	RADIO DIRECTION FIND	4.	248.	13840.	YES	0.	0.
	A2091	04041D	RADIO SET, AN/TRC-97	1.	170.	12025.	YES	0.	0.
	A2310	00008B	SHELTER, ELECTRICAL	10.	880.	33000.	YES	0.	0.
	A2320	05476A	SHELTER,ELECTRONICS	27.	2376.	83700.	YES	2160.	0.
	A2340	02819C	SHOP, ELECTRONIC, AN	11.	968.	52250.	YES	0.	0.
	A2350	03312R	SHOP, ELECTRONIC, AN	10.	800.	47500.	YES	0.	0.
	A2360	04408A	SHOP, ELECTRONIC, AN	2.	176.	12280.	YES	0.	0.
	A2392	04954A	SIGNAL MONITOR FACIL	4.	168.	32160.	YES	0.	0.
	A2394	05851A	SIGNAL MONITOR FACIL	2.	0.	0.	NO	0.	0.
	A2394A	05851A	TRK, W/SHLTR, SIGNAL	2.	352.	44720.	NO	0.	0.
	A2394B	05851A	TRLR, SIGNAL MONTR F	2.	192.	5500.	NO	0.	0.
	A2440	03485R	SPEC COMM CENTRL, AN	8.	1664.	73040.	NO	0.	0.
	A2530	04019A	TACTICAL AIR OPN CEN	1.	0.	0.	YES	0.	0.
	A2530A	04019A	AN/TYA-5, 1 HUT	1.	93.	5000.	YES	0.	0.
	A2530B	04019A	AN/TYA-9A, OP HUT NO	1.	82.	5215.	YES	0.	0.
	A2530C	04019A	AN/TYA-9A, OP HUT NO	1.	82.	5215.	YES	0.	0.
	A2530D	04019A	AN/TYA-9A, OP HUT NO	1.	82.	5215.	YES	0.	0.
	A2530E	04019A	AN/TYA-9A, OP HUT NO	1.	82.	5215.	YES	0.	0.
	A2530F	04019A	AN/TYA-9A, OP HUT NO	1.	82.	5215.	YES	0.	0.
	A2530G	04019A	AN/TYA-12 VII HUT	1.	82.	4475.	YES	0.	0.
	A2530H	04019A	AN/TYA-18 NO 1 2AHUT	1.	82.	4215.	YES	0.	0.
	A2530I	04019A	AN/TYA-18 NO 2 2AHUT	1.	82.	4215.	YES	0.	0.

AD-A041 598 STANFORD RESEARCH INST MENLO PARK CALIF NAVAL WARFAR--ETC F/G 15/5

MATERIEL WEIGHT AND CUBE CONTROL (1975-1980).(U)

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Table VIII-4 (cont)

INITIAL ISSUE OF MAJOR EQUIPMENT FOR SHELTER-AE

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	SQ FT	LBS	NML	******CARGO****** CU FT	LBS
	A2530J	04019A	AN/TYA-7 III HUT	1.	82.	5000.	YES	0.	0.
	A2530K	04019A	AN/TYA-25 PHOTO HUT	1.	82.	2920.	YES	0.	0.
	A2530L	04019A	AN/TYA-26 ANCILLARY	1.	82.	3610.	YES	0.	0.
	A2530M	04019A	AN/TYA-23 UNIT TEST	1.	82.	3450.	YES	0.	0.
	A2530N	04019A	AN/TYA-27 MAINT HUT	1.	82.	3900.	YES	0.	0.
	A2530O	04019A	J-2373/TYQ-2 PWR DIS	1.	26.	1300.	YES	0.	0.
	A2530P	04019J	CABLE PALLET NO 1	1.	82.	3496.	YES	0.	0.
	A2530Q	04019A	CABLE PALLET NO 2	1.	82.	4021.	YES	0.	0.
	A2530R	04019A	CABLE PALLET NO 3	1.	82.	3991.	YES	0.	0.
	A2530S	04019A	CABLE PALLET NO 4	1.	82.	3921.	YES	0.	0.
	A2530T	04019A	CABLE PALLET NO 5	1.	82.	4106.	YES	0.	0.
	A2530U	04019A	CABLE PALLET NO 6	1.	82.	4271.	YES	0.	0.
	A2530V	04019A	CABLE PALLET NO 7	1.	82.	3841.	YES	0.	0.
	A2530W	04019A	CABLE PALLET NO 8	1.	82.	3881.	YES	0.	0.
	A2530X	04019A	CABLE PALLET NO 9	1.	82.	3851.	YES	0.	0.
	A2530Y	04019A	CABLE PALLET NO 10	1.	82.	3831.	YES	0.	0.
	A2530Z	04019A	CABLE PALLET NO 11	1.	82.	2981.	YES	0.	0.
	A2540A	04429A	AN/TYA-17, AN/TYQ-3	1.	82.	5100.	YES	0.	0.
	A2540B	04429A	AN/TYA-19, AN/TYQ-3	1.	82.	4900.	YES	0.	0.
	A2540C	04429A	AN/TYA-20, AN/TYQ-3	1.	82.	4844.	YES	0.	0.
	A2540D	04429A	AN/TYA-24, AN/TYQ-3	1.	82.	4800.	YES	0.	0.
	A2540E	04429A	CABLE PALLET, AN/TYQ	1.	80.	1130.	YES	0.	0.
	A2540F	04429A	ANTENNA PALLET, AN/T	2.	102.	5040.	YES	0.	0.
	A2540G	04429A	AN/GRM-86, AN/TYQ-3	1.	89.	3400.	YES	0.	0.
	A2620	06669A	TELEPH EXCHNG, TRANS	1.	0.	0.	NO	0.	0.
	A2620A	06669A	TRLR NO 1, TELEPH EX	1.	316.	32000.	NO	0.	0.
	A2620B	06669A	TRLR NO 2, TELEPH EX	1.	316.	32000.	NO	0.	0.
	A2696	07506A	TEST INSTRUMENT REPA	1.	80.	5150.	NO	0.	0.
	A3230	04406A	TRANSLATOR TRANSCRIB	2.	360.	33670.	YES	0.	0.
	B1200		IMAGERY INTERPRETATI	1.	176.	14180.	YES	0.	0.
	B1455	01545A	PHOTO PRINTING + PRO	1.	226.	21030.	NO	0.	0.
	B1940	03540C	SHOP EQUIPMENT, CONT	2.	238.	16230.	NO	0.	0.
	B1950	03533B	SHOP EQUIPMENT, GENE	1.	213.	28380.	NO	0.	0.
	B1960	03539R	SHOP EQUIPMENT, ORGA	2.	500.	65560.	NO	0.	0.
	B2595	04421A	VAN, ELECTRICAL EQUI	2.	586.	19200.	NO	0.	0.
	D0270	04234D	SEMI TRAILER, VAN-RE	4.	848.	66320.	NO	0.	0.
	D0290	04421A	SEMI-TRAILER, VAN, E	6.	1326.	88200.	NO	0.	0.
	D0310A	00553A	TRK VAN, SHOP SET, F	6.	1098.	111900.	NO	0.	0.
	D0310B	00553A	TRK M35, SHOP SET, F	12.	2052.	200904.	NO	0.	0.
	D0320	00560A	SHOP SET, FM, AUTOMO	6.	1092.	106632.	NO	0.	0.
	D0330	06018A	SHOP SET, FM, AUTOMO	6.	1092.	108180.	NO	0.	0.
	D1190	00663D	TRUCK, VAN, 2-1/2T M	8.	1448.	121848.	NO	0.	0.
	E0560	02341A	GUIDED MISSILE,CONTR	1.	112.	5400.	YES	0.	0.
	E1660	00564A	SHOP SET, FM, BASIC,	4.	720.	133144.	NO	0.	0.
	E1680	00566A	SHOP SET, MACHINE, B	7.	0.	0.	NO	0.	0.

Table VIII-4 (cont)

INITIAL ISSUE OF MAJOR EQUIPMENT FOR SHELTER-AE

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	SQ FT	LBS	NML	******CARGO****** CU FT	LBS
	E1680A	00566A	VAN, SHOP SET, MACHI	7.	1267.	131985.	NO	0.	0.
	E1680B	00566A	TRLR, SHOP SET, MACH	7.	658.	18550.	NO	0.	0.
	E1690	00566	SHOP SET, FM, MACHIN	3.	0.	0.	NO	0.	0.
	E1690A	00566A	VAN, SHOP SET, FM, M	3.	543.	61317.	NO	0.	0.
	E1690B	00566A	TRLR, SHOP SET, FM,	3.	282.	7950.	NO	0.	0.
	E1700	00567A	SHOP SET, FM, MACH,	3.	0.	0.	NO	0.	0.
	E1700A	00567A	VAN, SHOP SET, FM, M	3.	543.	61548.	NO	0.	0.
	E1700B	00567A	TRLR, SHOP SET, FM,	3.	282.	7950.	NO	0.	0.
	E1710	00562A	SHOP SET, FM, MOBILE	4.	724.	61200.	NO	0.	0.
	E1730	00568A	SHOP SET, FM, WELDIN	3.	0.	0.	NO	0.	0.
	E1730A	00568A	VAN,SHOP SET, FM, WE	3.	543.	49443.	NO	0.	0.
	E1730B	0568AT	RLR, SHOP SET, FM, W	3.	282.	7950.	NO	0.	0.
CLASS VIIW TOTAL (T/E TYPE 1)					32097.	2388406.		2160.	0.
OTHER CLASS VIIW (T/E TYPE 3)									
TOTAL CLASS VIIW					32097.	2388406.		2160.	0.

Table VIII-5

GENERAL CARGO FOR SHELTER-AE

CATEGORY	GAL	SQ FT	CU FT	POUNDS
CLASS I			0.	0.
CLASS II			5.	50.
CLASS III DIESEL	8382.		1416.	62642.
CLASS III MOGAS	5866.		989.	38648.
CLASS III JP	0.		0.	0.
CLASS III KEROSENE	106.		22.	829.
CLASS IIIW LUBE	432.		88.	3715.
CLASS IIIA LUBE	0.		0.	0.
CLASS IIIW (MARCORP)	0.		10.	311.
CLASS IV			0.	0.
CLASS VW			0.	0.
CLASS VA			0.	0.
CLASS VZ			0.	0.
CLASS VI			0.	0.
CLASS VII NON-SQUARE			3450.	38653.
CLASS VIII			0.	0.
CLASS IXW			605.	6649.
CLASS IXA			0.	0.
CLASS IXZ			0.	0.
CLASS X			0.	0.
TOTAL			6584.	151497.
CLASS VII SQUARE		32097.	284299.	2388406.

READ AN INPUT CARD. CARD IS...STOP

Table VIII-6

MOUNT OUT (CLASS III) FOR SHELTER-AE

ORGANIZATIONAL LOAD

		*********5 GAL CANS*********			*****TANKERS*****			*******55 GAL DRUMS*******			***DRY PACKAGES**	
	DOS	CANS	GALLONS	POUNDS	GALLONS	POUNDS	DRUMS	GALLONS	CU FT	POUNDS	CU FT	POUNDS
DIESEL	5	0.	0.	0.	0.	0.	53.	2809.	583.	22498.		
MOGAS	5	0.	0.	0.	0.	0.	37.	1961.	407.	13979.		
JP	0				0.	0.	0.	0.	0.	0.		
KEROSENE	5	0.	0.	0.			1.	53.	11.	414.		
LUBE (IIIW)	5						3.	162.	33.	1393.	0.	0.
LUBE (IIIA)	5						0.	0.	0.	0.		
CLASS IIIW (MARCORP)	5						0.	0.	0.	0.	3.	104.
TOTAL		0.	0.	0.	0.	0.	94.	4985.	1034.	38285.	3.	104.

Table VIII-7

MOUNT OUT (CLASS III) FOR SHELTER-AE

LANDING FORCE SUPPLIES

	55 GAL DRUMS					BULK				DRY PACKAGES		
CATEGORY	DOS	DRUMS	GALLONS	CU FT	POUNDS	DOS	GALLONS	CU FT	POUNDS	DOS	CU FT	POUNDS
DIESEL	2	22.	1166.	242.	9339.	8	4407.	591.	30804.			
MOGAS	2	15.	795.	165.	5667.	8	3110.	417.	19002.			
JP	2	0.	0.	0.	0.	13	0.	0.	0.			
KEROSENE	2	1.	53.	11.	414.	8	0.	0.	0.			
LUBE (IIIW)	10	5.	270.	55.	2322.					10	0.	0.
LUBE (IIIA)	10	0.	0.	0.	0.							
CLASS IIIW (MARCORP)	10	0.	0.	0.	0.					10	7.	208.
TOTAL		43.	2284.	473.	17742.		7517.	1007.	49806.		7.	208.

This procedure was repeated to find the square increase in the assault follow-on echelon. Similar calculations are made for cube and weight. Additionally, fuel consumption and repair part utilization can be compared in an identical manner.

F. The Effect of Introducing the Proposed New Shelter System Into the Lift Requirements of the Notional MAF

If the new system of shelters is adopted by the Marine Corps, the following impacts on the lift requirements of the notional MAF will result. These impacts are derived from a comparative analysis between the existing system and the replacement system of shelters using Program MAGTF.

- An increased 8,500-square-foot lift requirement for the assault echelon
- An increased 5,400-square-foot lift requirement for the assault follow-on echelon
- An increased 13,900-square-foot lift requirement for the entire MAF
- A 25 percent increase in the gallons of fuel required for both the assault echelon and the assault follow-on echelon of the MAF
- An increased 1,900-cubic-foot lift requirement for the assault echelon
- An increased 600-cubic foot lift requirement for the assault follow-on echelon.

The increases in square and bulk resulting from the introduction of the new shelter system were judged to be insignificant when compared with the total lift requirements of all landing force materiel in the MAF.

The increase in fuel requirements was found to be the result of freeing transports that were previously dedicated to shelters by introducing trailers to convey the new shelters by the use of the 6-ton tractor. Unlike the old dedicated vehicles, the new 6-ton tractor is capable of

assisting in other logistic needs when not pulling trailers loaded with shelters. As a result, the new truck tractor is used many more hours per day than the dedicated vehicles and, therefore, consumes more fuel.

G. Conclusions

1. The comparative analysis between the existing/replacement shelter systems performed with the assistance of Program MAGTF to determine the effects upon amphibious shipping requirements has demonstrated the usefulness of the program in a cube, square, and weight control program.

2. The "conceptual stage" of system and materiel acquisition by the Marine Corps could utilize Program MAGTF to determine the total effects of the new acquisition on the lift requirements of the MAF.

3. The utility of Program MAGTF may also be used in the "conceptual phase" of system and materiel acquisition to investigate the secondary effects of the acquisition, such as fuel consumption, repair parts requirements, ammunition consumption, and personnel requirements.

IX AMPHIBIOUS STAFF PLANNING AND THE CONSTRAINED AMPHIBIOUS LIFT ANALYSIS SYSTEM (1985)

A. General

The Constrained Amphibious Lift Analysis System (CALAS) developed during the course of conducting the Materiel Weight and Cube Control Study provided a systematic computational procedure to optimize the operational readiness of a MAGTF when required to be embarked into less amphibious assault shipping than needed for the specified MAGTF materiel. At the beginning of the project, no attempt was made to develop computer software requiring installation on a Marine Corps computer system. Those computer programs planned for development within the study were expected to be used to analyze data, perform necessary calculations, and to provide information necessary to gain insight into the complex problems presented by the study objectives. However, the solution to the problem of finding a practical means of temporarily eliminating items from unit T/Es necessary to reducing units' cargo requirements without decreasing the real operational readiness, resulted in the development of the Constrained T/E Embarkation Analysis Model whose capabilities became practical, relatively easy to use, and produced useful results in the constrained T/E listings and computed ordinal operational readiness index. With this development late in the study, the framework for a solution procedure involving all the earlier computer models was identified in such a way that the entire group of computer models formed the system called CALAS. It was then determined that CALAS was the type of system that could be installed as a computer assisted decision aid to the amphibious staff planner, where the computational power of its models could be combined with the experience and judgment of the commander and

staff, to rapidly identify the extent of a constrained ship loading problem for any size MAGTF, and then find the best solution within the existing constraints.

The difficulties associated with installing and utilizing computerized mathematical models developed during operations research studies for Headquarters, U.S. Marine Corps, is well recognized. While no deliberate attempt was initially made to provide models requiring such installation in an environment having no organization to perform such functions, the obvious long term usefulness of CALAS requires that a computer environment be identified for it to operate within. Furthermore, the solution options offered in this study for loading the notional CSS MAF into constrained shipping are certainly of interest in emphasizing the nature of problems to be faced by MAF commanders. However, the availability of CALAS to actually assist the commander and his staff in solving a real time problem is of much greater importance. Therefore, installation of CALAS in some USMC computer environment today and/or in the future demands careful consideration.

B. <u>CALAS Within an Automated Command and Control System</u>

The definition of the future Automated Data Systems (ADS) to support Marine Corps information requirements is now being analyzed within on-going studies. The development of the Marine Tactical Command and Control System (MTACCS) is also in progress. While it is not possible to state the precise computer hardware/software structure that these systems may ultimately take, the residence of a software system such as CALAS within the future ADS structure is entirely feasible. It is the operational configuration of the future ADS structure to support CALAS that is proposed in the following discussion. Whether there will be one Management Information System (MIS) supporting

administrative information requirements and the subsystems comprising MTACCS being available in garrison and deployed, or two separate systems each supporting specifically designated subsystems operating side by side is not of concern to this presentation.

1. <u>CALAS and MIS</u>

The time is 1985. A warning order has been received by CG of the MAF involving a possible combat mission for a MAGTF to deploy by sea to a specified area in the world.

The commander and his staff select a troop list to execute the mission. The G-4 prepares an input list for the MAGTF subsystem within CALAS to generate the lift requirements. A computer terminal placed in the G-4 office is used to input the troop list and the necessary days of supply formatted for the MAGTF Program. When the input list is entered, the G-4 operator executes the MAGTF Program. The version installed has been modified so that it executes in less than three hours, depending on the number of units in the troop list. Should the force be a MAF, then the MAGTF run would consist of only the assault echelon units so that output would be immediately available for determining the assault shipping requirements. The run for the AFOE would be executed at a later time.

In this environment, the MAGTF output listings would be directed to be printed at the Force Automated Services Center (FASC), if desired, but any page of the printed listing could be presented on the computer terminal scope--also when desired. A disk file would have been created by the MAGTF Program containing the factored cargo data needed for input to the Constrained Cargo Factoring Model (CCF).

The G-4 determines from the Commander Amphibious Task Force (CATF) or appropriate type commander the number of amphibious assault

ships to be made available. With this information, the input ship file (which always contains all USN available ships on the MIS) for the CCF Model is modified for the simulated loading problem. The G-4 operator then executes the CCF Model for no constrained loading unless previous experience indicates a lift short fall will be certain. In this case, the CCF Model can be run with constrained values from 100 to 60, or as desired by varying the constraint file within the MIS through the terminal. The results from the CCF Model are printed on the scope, and the G-4 observes that a short fall of some significant magnitude exists. He also observes the short fall computed from each constraint. He finds that, after constraining the T/E by 70 percent, all the ships are loaded. However, he would like to rerun the CCF Model, changing the DOS for mountout. After observing the combined effect of constraining unit T/Es and reducing mountout, he now examines the constrained T/E listings for any units of interest as computed from the Constrained T/E Embarkation Analysis Model (CTEAM) for the constraints used. These listings indicate the equipment to be eliminated from the unit load and put in assault shipping, be left behind, or carried in follow-on shipping.

In reviewing the eliminated T/E listing of units for the constraint value of interest, any TAM items designated for elimination that the staff planner considers essential for the mission assigned can have their criticality factor changed within the input file for the CTEAM Model. The model can continue to be reprocessed until the unit or units eliminated T/E listing meets the needs of the mission.

After making T/E adjustments and reviewing results, the G-4 may now present recommendations to the CG for alterations of the troop list based on the results produced by CALAS. Depending on the CG's decision, the G-4 may either have an acceptable constrained loading problem solution or be required to make further adjustments to the troop

list and resolve the problem, in total or only partially, through CALAS. He is now ready to issue the warning order to subordinate commands. The important fact is that all these calculations and adjustments were made in less than 5 hours.

At each level of command, the same type of terminal is available to the staff, and the constrained loading problem may be solved for a reduced size problem pertinent to each command level. For instance, the CO BLT may be interested in looking at the T/E presented by the MAGTF Program to compare the lift requirement developed from authorized allowances for an infantry battalion with what he has on hand for some appropriate action. The criticality factors used in the system may be of more interest to this level and could be altered as needed to recompute the constrained T/E from the latest adjustments.

The description presented here assumed that all programs constituting CALAS were installed on the MIS, that all data files were resident on the MIS data base and accessed by the programs as needed, that all system job control commands were resident on the system, and that execution commands were structured to be easily used by terminal operators. Nothing presented here is beyond the current technical operational capability of USMC computer systems.

2. Development of MIS Information Requirements

Studies conducted to develop information requirements for an MIS have had great difficulty. Perhaps an approach to determining MIS requirements is the study of problems within functional areas seeking useful solution. As in this study, the definition of information requirements that may be incorporated into an MIS may very well arise from independent study of the functional problem. This approach may suggest the procedure to follow in defining information requirements for other functional problems.

C. Implementation Considerations

As previously indicated, installation of CALAS on a USMC computer system is entirely possible. It could be installed in the current MAF FASC environment and converted later to an MIS environment. There are a number of implementation tasks that would have to be accomplished. These tasks are briefly described below.

1. Program Conversion to IBM 360

All CALAS programs were developed to support the analysis of the current study, and were written for the CDC 6400 SRI computer. Certain program statements would have to be modified and tested for an IBM 360 before installation.

2. MAGTF Improvement Project

The current version of the MAGTF Program is still less efficient than is possible for minimum time operation. A proposal has been submitted to HQMC to conduct the improvement task so that the system could operate efficaciously on the MAF computers.

3. MAGTF Data Base Maintenance

The validity of CALAS depends on the accuracy of the MAGTF data base. MAGTF has been operational for just over one year. Experience gained during this period has demonstrated the need to have an ongoing program to maintain the currency of the files. SRI has also submitted a proposal to provide maintenance support for this effort. Included in this proposal are certain modifications to the peripheral programs updating the data base that will improve completeness and reduce the current level of manual update requirements.

4. Development of Criticality Factors for All FMF T/Es

For the current study, only a sample of 10 units were coded which assigned criticality factors to TAM items in the T/Es. This coding was all done to current unit T/Es. Since the shift to the new CSS structure for the final analysis of the study, these coded T/Es were also obsolete, but had to be used. For implementation, all current FMF T/Es would have to be coded using the same guidance followed during this study.

There will no doubt be additional tasks defined for system implementation should a detailed study of requirements be authorized.

D. Conclusions

The following conclusions from this section are presented.

(1) It is feasible to implement CALAS on USMC computer systems to function as a computer assisted decision aid.

(2) Current USMC computer installation work loads will dictate the timing of installing CALAS on USMC computer systems.

Appendix A

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Appendix A

BIBLIOGRAPHY

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Appendix B

TROOP LISTS AND SAMPLE MAGTF OUTPUT

Part 1: Troop Lists

MARINE AMPHIBIOUS FORCE (MAF) TROOP LIST
FOR MAGTF LIFT REQUIREMENTS
(NOTIONAL MAF)

Assault Echelon: Command Element*

T/O No.	Unit Type Code	Multiple	Unit Descriptor
4623M	PTLAA	1	For Recon Co
4722M	PYDAA	2	CI Team
4732M	PUEAA	2	SCC Team
4918M	CS2AA	1	HQ MAF
4919M	9BUAA	1	H&S Co, MAF
4998M	VYBAA	1	Civil Affairs Group
	Radio Bn		
4735M	PU1AB	1	EW Co
4735A	PU2AB	1	Aug EW Co
4736M	PU3AB	1	Opns Co
4736A	PU4AB	1	Aug Opns Co
4737M	PU5AB	1	H&S Co
4737A	PUBAB	1	Aug H&S Co
	Communications Bn		
4863M	6UNAA	1	Comm Spt Co
4873M	6UMAA	1	Long Lines Co
4883M	9UKAA	1	Comm Co
4886M	9UJAA	1	HQ Co

*MAGTF data base designation for entire Command Element:
T/O No. = CMD-GP
Unit type code = CS2AA
Multiple = 1

Assault Echelon: Ground Combat Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
		Marine Division /-/	
1038M	9GUAA	9	Inf Bn, Inf Regt
1096M	9GSAA	3	HQ Co, Inf Regt
1128M	9HLAA	3	D/S Arty Bn, Arty Regt
1196M	9HEAA	1	HQ Btry, Arty Regt
1378M	4HTAA	1	Engr Bn, MARDIV
1423M	PHRAA	4	Recon Co, Recon Bn
1427M	9HQAA	1	H&S Co, Recon Bn
1653M	UJUAA	3	Truck Co, MT Bn
1657M	9JTAA	1	H&S Co, MT Bn
1883M*	6GJAA	1	Comm Co, HQ Bn
1903M*	QGHAA	1	MP Co, HQ Bn
1985M*	9GGAA	1	Serv Co, HQ Bn
1986M*	M1986	1	Div HQ, HQ Co, HQ Bn
1987M*	9GLAA	1	HQ Co, HQ Bn
		Tank Bn	
4233M	2SRAA	4	Med Tank Co
4237M	9SNAA	1	H&S Co, Tank Bn
		AMTRAC Bn	
4652M	2TXAB	4	AMTRAC Co
4654M	9TWAA	1	H&S Co, AMTRAC Bn
		Field Artillery Group	
4112M	1SHGA	1	8" How Btry
4193M	1SKGA	2	175 Gun Btry
4201M	1YKAA	1	Searchlight Btry
4226M	9SGAA	1	HQ Btry, FAG

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*MAGTF data base designation for all units noted:

T/O No. = 1998M
Unit type code = 9GDEJ
Multiple = 1

Assault Echelon: Aviation Combat Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0601F	CLDAA	1	HQ /-/ Marine Air Wing
0604F	8LKAA	1	MWHS /-/
	Marine Air Control Group		
8612M	8LZAA	1	MWCS
8615M	8LPAA	1	H&HS, MACG
8625M	3LTAA	1	FAAD Btry
8631M	7LSAA	1	MACS/MTDS
8640M	7LRAA	1	MASS, MACG
	2nd Marine Air Group (VH)		
8621M	3LYAA	1	Missile Btry, LAAM Bn
8821M	7NLAA	2	MATCU
8859M	3NSAA	1	VMA (V) (20AV-8A)
8914M	8PCAA	2	H/MS (single site)
8921M	8PDAA	2	MABS (single site)
8937M	3PNAA	3	HMM (18 CH-46)
8944M	3PLAA	3	HMH (18 CH-53A)
8964M	3PQAA	2	HMM (21 UH-1N)
8968M	3PFAA	1	VMO (18 OV-10A)
8970M	3PUAB	1	HMA (18 AH-1J)

Assault Echelon: Combat Service Support Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
		Medical Bn	
1523M	FJQAA	4	C/C Co, Med Bn
1557M	9JPAA	1	H&S Co, Med Bn
		Service Bn	
0300F	M0300	1	HQ Force Log Serv
0301F	JJEAA	1	Supply Co, Serv Bn
0303F	9JBAA	1	H&S Co, Serv Bn
1743M	HJFAA	1	Maint Co, Serv Bn
1753M	UJCAA	1	Truck Co, Serv Bn
		Shore Party Bn	
1863M	9JKAA	3	SP Co, SP Bn
1867M	9JJAA	1	H&S Co, SP Bn
		Military Police Bn	
4903M	QURAA	3	MP Co, MP Bn
4907M	9UQAA	1	H&S Co, MP Bn
		Engineer Bn	
0305F	9SYAA	1	Serv Co /-/ Engr Bn
0307F	9SXAA	1	HQ Co /-/ Engr Bn
4353M	4SZAA	2	Engr Co, Engr Bn
		Det Force Service Regt	
0312F	HVTGA	1	Det MT Maint Co
0314F	9VSAA	1	Det H&S Co, Maint Bn
0322F	JVLAA	1	Det Supply Co, Sup Bn
0324F	JVPAA	1	Det Ration Co
0326F	JVMAA	1	Det Ammo Co
0332F	JVGAA	1	Det Support Co
0701F	M0701	1	Naval Beach Group
3223M	HVYGA	1	Ord Maint Co
3243M	HVQGA	1	Engr Maint Co
3253M	HVUGA	1	Elec Maint Co
3333M	JVNAA	1	Bulk Fuel Co

- Total Assault Echelon -

Assault Follow-On Echelon: Command Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
4392M	4TBAA	1	TOPO Plt
4722M	PYDAA	1	CI Team

Assault Follow-On Echelon: Aviation Combat Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0602F	CLDAA	1	Det HQ MAW
0605F	8LKAA	1	Det MWHS
8820M	8NKAA	3	MABS, MAG VA/VF/VA (AW)
	LAAM Bn		
8620M	8LXAA	1	H&S Btry, LAAM Bn
8621M	3LYAA	2	Missile Btry, LAAM Bn
	MWSG /-/		
8710M	8MLAA	1	H&MS, MWSG
8715M	8MNAA	1	WERS

Assault Follow-On Echelon: Combat Service Support Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
3333P	JTCAA	1	Sep Bulk Fuel Co
4343M	4SUAA	1	Bridge Co
4512M	FTGAA	1	Hosp Co
4552M	FTFAA	4	Dental Co
4592M	FJJAA	1	Sep Surgical Co
4903M	QURAA	1	MP Co
	Det Service Bn		
0302F	JJEAA	1	Det Sup Co
0304F	9JBAA	1	Det H&S Co
	Motor Transport Bn		
4643M	UTSAA	3	Truck Co
4644M	UTRAA	1	Transport Co
4647M	9TQAA	1	H&S Co
	Engineer Bn		
0306F	9SYAA	1	Det Service Co
0308F	9SXAA	1	Det HQ Co
4353M	4SZAA	2	Engr Co
	Force Service Regt /-/		
0313F	HVTGA	1	MT Maint Co /-/
0315F	9VSAA	1	H&S Co /-/ Maint Bn
0323F	JVLAA	1	Supply Co /-/ Supply Bn
0325F	JVPAA	1	Ration Co /-/ Supply Bn
0327F	JVMAA	1	Ammo Co /-/ Supply Bn
0333F	JVGAA	1	Support Co /-/ H&S Bn
0702F	M0702	1	Mobile Constr Bn
3213M	HVXGA	1	GS Supply Maint Co
3346M	9VKAA	1	H&S Co, Supply Bn
3403M	JVHAA	1	Longshoreman Co, H&S Bn
3413M	UVEAA	1	Truck Co, H&S Bn
3443M	6VFAA	1	Comm Co, H&S Bn
3447M	9VDAA	1	H&S Co, H&S Bn

- Total Assault Follow-On Echelon -

Fly-In Echelon: Aviation Combat Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0603F	CLDAA	1	Det HQ Marine Air Wing
8652M	3QJAB	1	VMCJ (7 RF-4, 7 EA-6)
8712M	8LEAA	1	MWWU
8780M	3MQAA	1	VMGR
8821M	7NLAA	3	MATCU
	Det 3rd Marine Air Group (VF/VA)		
8813M	8NJAA	3	H-MS MAG (VA/VF)
8849M	3NMAC	4	VMFA (15 F-4J)
8855M	3NSAB	2	VMA (20 A-4)
8857M	3NUAA	2	VMA (AW) (12 A-6A)
8859M	3NSAA	1	VMA (V) (20 AV-8A)

- Total Fly-In Echelon

*** Total Notional MAF ***

MARINE AMPHIBIOUS FORCE (MAF) TROOP LIST
FOR MAGTF LIFT REQUIREMENTS
(CSS NOTIONAL MAF)

CSS Assault Echelon: Command Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
CMD-GP*	CS2AA	1	Command Group

*MAGTF data base designation "CMD-GP" includes all units noted in the notional MAF shown in Part 1 of this appendix.

CSS Assault Echelon: Ground Combat Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
1038M	9GUAA	9	Inf Bn, Inf Regt
1096M	9GSAA	3	HQ Co, Inf Regt
1128M	9HLAA	3	D/S Arty Bn, Arty Regt
1196M	9HEAA	1	HQ Btry, Arty Regt
1363X	4HYAA	1	Engr Spt Co, Cbt Engr Bn, DSG
1373X	4HWAA	4	Engr Co, Cbt Engr Bn, DSG
1377X	9HHAA	1	H&S Co, CBT Engr Bn, DSG
1423M	PHRAA	4	Recon Co, Recon Bn
1427M	PHQAA	1	H&S Co, Recon Bn
1862X	UJUAA	1	Truck Co, H&S Bn, DSG
1863X	9JYAA	1	Log Spt Co, H&S Bn, DSG
1864X	M1864	1	Svc Co, H&S Bn, DSG
1867X	M1867	1	HQ Co, H&S Bn, DSG
1988M	9GDEJ	1	HQ Bn, MARDIV
4112M	1SHGA	1	8" How Btry
4193M	1SKGA	2	175 Gun Btry
4201M	1YKAA	1	Searchlight Btry
4226M	9SGAA	1	HQ Btry, FAG
4233M	2SKAA	4	Medium Tank Co
4237M	9SNAA	1	H&S Co, Tank Bn
4623M	M4623	1	Force Recon Co
4643F	M4643	1	Det Trk Co, MT Bn
4652M	2TXAB	4	AMTRAC Co (LVTP-7)
4654M	9TWAA	1	H&S Co, AMTRAC Bn

CSS Assault Echelon: Combat Service Support Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0305F	9SYAA	1	Spt Co /-/ Engr Spt Bn
0307F	9SXAA	1	HQ Co /-/ Engr Spt Bn
0701F	M0701	1	Det B&P Co
3223X	HVYGA	1	Ord Maint Co
3233F	HVTGA	1	MT Maint Co /-/
3243X	HVWGA	1	Engr Maint Co
3247F	M3247	1	H&S Co /-/ Maint Bn
3253X	HVUGA	1	Elec Maint Co
3313F	M3313	1	Det Supply Co, FSSG
3323F	M3323	1	Det Ration Co, FSSG
3343F	M3343	1	Det Ammo Co, FSSG
3442F	M3442	1	Det B&P Co, H&S Bn
3447F	M3447	1	H&S Co, Sup Bn
3751X	M3751	1	Bulk Fuel Co, Engr Spt Bn
3753X	4SZAA	2	Engr Co, Engr Spt Bn
3851X	FTFAA	1	Dental Co
3853X	FJQAA	4	Med Co, Med Bn, FSSG
3857X	9JPAA	1	H&S Co, Med Bn, FSSG
4903M	QURAA	3	MP Co, MP Bn
4907M	9UQAA	1	H&S Co, MP Bn

CSS Assault Echelon: Aviation Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0601F	CLDAA	1	HQ /-/ Marine Air Wing
0604F	8LKAA	1	MWHS /-/ Det
8612X	8LZAA	1	MWCS, MACG Planning
8615X	8LPAA	1	H&HS, MACG Planning
8621X	3LYAA	1	Missile Btry, LAAM Bn
8625X	3LTAA	1	FAAD Btry, MACG, MAW Planning
8631X	7LSAA	1	MACS/MTDS Planning
8640X	7LRAA	1	MASS, MACG Planning
8821M	7NLAA	2	MATCU
8859X	3NSAA	1	VMA (V)
8914X	8PCAA	2	H-MS (single site)
8921M	8PDAA	2	MABS (single site)
8937X	3PNAA	3	HMM (18 CH-46)
8943X	3PLAA	3	HMH (18 CH-53A)
8964X	3PQAA	2	HML
8968X	3PFAA	1	VMO (18 OV-10A)
8970X	3PUAB	1	HMA (18 AH-1J)

- Total CSS Assault Echelon -

CSS Assault Follow-On Echelon: Command Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
4392M	4TBAA	1	TOPO Plt
4722M	PYDAA	1	CI Teams

CSS Assault Follow-On Echelon: Aviation Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0602F	CCDAA	1	Det HQ, Marine Air Wing
0605F	8LKAA	1	Det MWHS
8620X	8LXAA	1	H&S Btry, LAAM Bn
8621X	3LYAA	2	Missile Btry, LAAM Bn
8710X	8MLAA	1	H&MS, MWSG
8714X	M8714	1	Engr Sqdn
8715X	8MNAA	1	Trans Sqdn
8820X	8NKAA	3	MABS, MAG VA/VF/VA (AW)
8821M	7NLAA	3	MATCU

CSS Assault Follow-On Echelon: Combat Service Support Element

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0702F	M0702	1	Mobile Const Bn
3233N	HVTGA	1	Det MT Maint Co
3247N	9VSAA	1	H&S Co /-/ Maint Bn
3313N	JVLAA	1	Supply Co /-/ Supply Bn
3323N	M3323	1	Ration Co /-/ Supply Bn
3343N	JVMAA	1	Ammo Co /-/ Supply Bn
3347X	9VKAA	1	H&S Co, Supply Bn
3442N	M3442	1	B&P Co, H&S Bn
3443X	6VFAA	1	Comm Co, H&S Bn, FSSG
3444N	M3444	1	MP Co, H&S Bn, FSSG
3445N	M3445	1	Svc Co, H&S Bn, FSSG
3447N	9VDAA	1	H&S Co, Sup Bn
3751X	JTCAA	1	Bulk Fuel Co, Engr Spt Bn
3752X	45UAA	1	Bridge Co, Engr Spt Bn
3753X	45ZAA	1	Engr Co, Engr Spt Bn
3755N	M3755	1	Engr Spt Co, Engr Spt Bn
3757N	M3757	1	H&S Co, Engr Spt Bn
3851X	FTFAA	3	Dental Co
3853X	M3853	1	Med Co, Med Bn, FSSG
3854X	M3854	1	Hosp Co, Med Bn, FSSG
4643N	UTSAA	1	Trk Plt, Trk Co
4644X	UTRAA	1	Trans Co, MT Bn, FSSG
4647X	9TQAA	1	H&S Co, MT Bn, FSSG
4903M	QURAA	1	MP Co, MP Bn

- Total CSS Assault Follow-On Echelon -

CSS Fly-In Echelon

T/O No.	Unit Type Code	Multiple	Unit Descriptor
0603F	CLDAA	1	Det HQ, Marine Air Wing
8652M	3QJAA	1	VMCJ (7 RF-4 / 17 EA-6)
8712M	8LEAA	1	MWWU
8780X	3MQAA	1	VMGR (12 KC-130)
8813X	3NJAA	3	H-MS MAG (VA/VF)
8848X	3NMAC	4	VMFA (15 F-4J)
8855M	3NSAB	2	VMA (20 A-4)
8857X	3NUAA	2	VMA (AW) (12 A-6A)

- Total CSS Fly-In Echelon -

*** Total CSS Notional MAF ***

Appendix B

TROOP LISTS AND SAMPLE OUTPUT

Part 2: Sample Output

DATE 2 18 PAGE 1

T/O DESIGNATOR M1038

NAME INFANTRY BATTALION,INFREGT,MARDIV

COMPONENT OF

CONSISTING OF	UNIT NAME		TOTAL FOR COMPONENT
	M1039		1
	M1013		4
SYSTEM NAME E0892		DOES NOT EXIST.	
SYSTEM NAME E1155		DOES NOT EXIST.	
SYSTEM NAME K4100		DOES NOT EXIST.	
SYSTEM NAME K4510		DOES NOT EXIST.	
SYSTEM NAME K4800		DOES NOT EXIST.	
SYSTEM NAME C2330		DOES NOT EXIST.	
SYSTEM NAME C3255		DOES NOT EXIST.	
SYSTEM NAME C3340		DOES NOT EXIST.	
SYSTEM NAME C3430		DOES NOT EXIST.	
	M1037		1
SYSTEM NAME A0265		DOES NOT EXIST.	
SYSTEM NAME A0920		DOES NOT EXIST.	
SYSTEM NAME A1950		DOES NOT EXIST.	
SYSTEM NAME D0760		DOES NOT EXIST.	
SYSTEM NAME E0892		DOES NOT EXIST.	
SYSTEM NAME E1155		DOES NOT EXIST.	
SYSTEM NAME E1156		DOES NOT EXIST.	
SYSTEM NAME E1157		DOES NOT EXIST.	
SYSTEM NAME H2355		DOES NOT EXIST.	
SYSTEM NAME K4180		DOES NOT EXIST.	
SYSTEM NAME K4230		DOES NOT EXIST.	
SYSTEM NAME K4620		DOES NOT EXIST.	
SYSTEM NAME K5020		DOES NOT EXIST.	
SYSTEM NAME N6004		DOES NOT EXIST.	
SYSTEM NAME N6020		DOES NOT EXIST.	
SYSTEM NAME C2330		DOES NOT EXIST.	
SYSTEM NAME C3255		DOES NOT EXIST.	
SYSTEM NAME C3340		DOES NOT EXIST.	
SYSTEM NAME C3430		DOES NOT EXIST.	

PERSONNEL		OFFICER	ENLISTED	TOTAL
	MARCORP	45	1117	1162
	NAVY	3	65	68
	GRAND TOTAL	48	1182	1230

INITIAL ISSUE OF MAJOR EQUIPMENT FOR M1038

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	SQ FT	LBS	NML	******CARGO****** CU FT	LB
WEAPONS(CLASS VIIW)									
	E1480	03328B	RIFLE, 106MM, M40A1C	8.	360.	3360.	YES	0.	0
OTHER CLASS VIIW (T/E TYPE 1)									
	A1900	02474A	RADIO SET,AN/MRG-83,	2.	140.	8380.	NO	0.	0
	A1910	02903A	RADIO SET,AN/MRC-87,	1.	66.	3489.	NO	0.	0
	A1920	04660A	RADIO SET, AN/MRC-10	2.	122.	5070.	NO	0.	0
	A2182	07272A	RADIO TERMINAL SET,	2.	120.	6740.	NO	0.	0
	B0465	06604A	DECONT APPARATUS, PW	1.	54.	2641.	NO	0.	0
	D0090	00625B	CLEANER, STEAM PRESS	1.	38.	1054.	NO	0.	0
	D0840	04469B	TRAILER, AMPHIB CARG	18.	828.	10260.	NO	558.	9000
	D0875	05984A	TRAILER, FLATBED, 3/	5.	220.	3050.	NO	0.	7500
	D0890	05865A	TRUCK, AMBULANCE, 1/	1.	71.	2780.	NO	0.	0
	D1020	05989A	TRUCK, CARGO, 1-1/4T	7.	938.	51590.	NO	1029.	17500
	D1100	01118E	TRUCK, PLATFORM, UTI	30.	540.	27000.	NO	0.	24000
	D1160	04751A	TRUCK, UTILITY, 1/4T	20.	1220.	48000.	NO	0.	10000
CLASS VIIW TOTAL (T/E TYPE 1)					4717.	173414.		1587.	68000
OTHER CLASS VIIW (T/E TYPE 3)									
TOTAL CLASS VIIW					4717.	173414.		1587.	68000

INITIAL ISSUE OF MAJOR EQUIPMENT FOR M1038

NON-SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	****TOTAL***** CU FT	LBS
ORGANIZATIONAL WPNS						
	E1060	04706A	MORTAR, INFANTRY, 60	12.	144.	600.
	E1090	00519A	MORTAR,INF,81MM,M29	8.	496.	960.
OTHER CLASS VIIW						
	A1083	05975C	NIGHT VISION SIGHT,	36.	36.	468.
	A3275	03448A	WEAPON SIGHT, INFRA-	16.	16.	448.
	A0005	04177A	ACCESSORY KIT, RADIO	1.	5.	159.
	A0090	04531A	BATTERY CHARGER PP-6	13.	39.	611.
	A0320	00044A	CONTROL RADIO SET, A	12.	12.	240.
	A0328	06692A	CONVERTER FREQUENCY	4.	4.	36.
	A0490	04704B	DETECTING SET, SEISM	25.	25.	300.
	A0710	00124C	GENERATOR SIGNAL, AN	1.	1.	42.
	A0800	00036B	GENERATOR SIGNAL, AN	1.	5.	94.
	A0922	03449A	METASCOPE, ASSEMBLY,	15.	15.	45.
	A1086		NIGHT VISION SIGHT,	4.	12.	156.
	A1087	07098A	NIGHT VISION SIGHT,	4.	20.	236.
	A1180	04310C	OSCILLOSCOPE, AN/USM	1.	1.	26.
	A1240	00251B	POWER SUPPLY, PP-388	1.	8.	252.
	A1250	07021A	POWER SUPPLY PP	2.	2.	20.
	A1420	05867A	RADAR SET AN/PPS-6	2.	22.	186.
	A1570	02394A	RADIAC COMPUTER INDI	1.	1.	45.
	A1730	04616A	RADIO SET,CONTROL GR	15.	15.	330.
	A1800	04617A	RADIO SET, AN/GRC-12	7.	7.	392.
	A1940	07009A	RADIO SET, AN/MRC-12	2.	700.	5150.
	A2010	03816A	RADIO SET, AN/PRC-41	3.	24.	303.
	A2020	03817A	RADIO SET, AN/PRC-47	5.	40.	695.
	A2040	06828A	RADIO SET AN/PRC-75	3.	3.	69.
	A2050	05916A	RADIO SET, AN/PRC-77	58.	58.	1160.
	A2150	04622A	RADIO SET, AN/VRC-47	2.	4.	220.
	A2184	07277A	RADIO TERMINAL SET,A	2.	4.	110.
	A2240	05866A	RECEIVING SET RADIO	1.	1.	64.
	A2390	06715A	SIGNAL LAMP EQUIPMEN	10.	10.	50.
	A2480	00276A	SWITCHBOARD, TELEPHO	5.	5.	140.
	A2580	00092A	TELEGRAPH TERMINAL G	3.	3.	291.
	A2660	00041A	TELETYPEWRITER SET,	1.	5.	90.
	A2685	06963A	TERMINAL, TELEGRAPH-	4.	4.	40.
	A2700	04680A	TEST KIT, MK-992/VRC	1.	1.	20.
	A2710	04679A	TEST KIT, MK-993/PRC	2.	2.	50.
	A2900	00316B	TEST SET, RADAR, TS/	1.	2.	30.
	A3280	07096A	VOLTMETER AN/USM-328	3.	3.	45.
	B1360	03965A	MOTOR GENERATOR, PU-	1.	8.	255.
	C6215	06894A	SPRAYER AND DUSTER,	1.	6.	84.

INITIAL ISSUE OF MAJOR EQUIPMENT FOR M1038

NON-SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	****TOTAL***** CU FT	LBS
	E0180	00476A	CIRCLE,AIMING,M2	1.	1.	10.
	E0230	03416A	COMPRESSOR,RECIPROCA	1.	4.	68.
	E1260	02193A	QUADRANT, FIRE CONTR	2.	2.	6.
	E1900	00591A	TELESCOPE, OBSERVATI	2.	2.	10.
	H2237	00762B	FREQUENCY METER, AN/	1.	7.	102.
	H2247	04418A	GENERATOR SIGNAL, AN	1.	1.	13.
	H2332	04530A	MULTIMETER, ELECTRON	1.	2.	24.
	H2333	00091D	MULTIMETER AN/PSM-4E	2.	2.	14.
	H2357	04626A	POWER SUPPLY, PP-295	1.	3.	48.
	H2363	02543A	PUBLIC ADDRESS SET,	2.	76.	756.
	H2368	00080A	RADIAC SET, AN/PDR-2	10.	10.	650.
	H2374	03963A	RADIAC METER, IM-174	10.	10.	50.
	H2443	02336A	TELEPHONE SET, TA-31	35.	35.	315.
	H2468	00125C	TEST SET, RADIO, AN/	1.	1.	10.
	H2469	00020E	TEST SET, ELECTRON T	1.	1.	0.
	J3191	00984D	REFRIGERATOR, MECH H	2.	92.	644.
	N6021		LAUNCHER, 35MM, PRAC	20.	100.	2440.
TOTAL NON-SQUARE LOADED					2118.	19672.

INITIAL ISSUE OF SECONDARY EQUIPMENT AND SUPPLIES FOR M1038

CATEGORY	CU FT	POUNDS
CLASS IIW (TYPE 1)	24945.	357399.
CLASS IIW (TYPE 2)*	5.	15.
TOTAL CLASS IIW	24950.	357414.
CLASS IV (TYPE 2)*	15.	245.
TOTAL CLASS IV	15.	245.
TOTAL INITIAL ISSUE	24965.	357659.

* NON-CONSUMABLES ONLY

INITIAL ISSUE PLUS MOUNT OUT (90 DAYS) OF SECONDARY EQUIPMENT AND SUPPLIES FOR M1038

CATEGORY	CU FT	POUNDS
TOTAL	0.	0.

OPERATING STOCKS OF M1038

CATEGORY	CU FT	POUNDS
CLASS IXW	1466.	76112.
TOTAL	1466.	76112.

INITIAL ISSUE OF WEAPONS FOR M1038

CATEGORY	CONTROL NUMBER OR FSN	ID	SUPPLY CLASS	DESCRIPTION	QUANTITY
ORGANIZATIONAL WPNS SQUARE LOADED					
	E1480	03328B	CL VII	RIFLE, 106MM, M40AIC, W/E -MT	8.
ORGANIZATIONAL WPNS NON-SQUARE LOADED					
	E1060	04706A	CL VII	MORTAR, INFANTRY, 60MM M89/M2	12.
	E1090	00519A	CL VII	MORTAR,INF,81MM,M29 W/E	8.
	E0990	02705A	CL II	MACHINE GUN 7.62MM M60	35.
	E0320	03893A	CL II	DISPERSER,RIOT CONTROL AGENT,	2.
INDIVIDUAL WEAPONS					
	E0890	02627A	CL II	LAUNCHER, GRENADE, 40MM, M79 W	36.
	E0900	07265A	CL II	LAUNCHER,ROCKET,66MM M-202	12.
	E0920	00508B	CL II	LAUNCHER,RKT,35IN,M20A1B1 W/E	40.
	E1180	00526A	CL II	PISTOL, AUTO, CAL 45, M1911A1,	291.
	E1240	00530A	CL II	PROJECTOR, PYROTECHNIC, HAND,	20.
	E1440 A	5538A	CL II	RIFLE,5.5MM,M16A1,W/E	938.

TOTAL INITIAL ALLOWANCE FOR M1038

CATEGORY	CU FT	POUNDS
TOTAL INITIAL ALLOWANCE	49856.	626857.
NML INITIAL ALLOWANCE	7890.	92089.
TOTAL INITIAL ALLOWANCE - (NML)	41966.	626857.

MOUNT OUT (CLASS I, CLASS VI, AND CLASS VIII) FOR M1038

CATEGORY	*******ORGN LOAD******			***LANFOR SUPPLIES***			********TOTAL********		
	DOS	CU FT	POUNDS	DOS	CU FT	POUNDS	DOS	CU FT	POUNDS
CLASS I(A RATIONS)	0	0.	0.	0	0.	0.	0	0.	0.
CLASS I(B RATIONS)	0	0.	0.	0	0.	0.	0	0.	0.
CLASS I(MCI)	5	1215.	39975.	10	2429.	79950.	15	3644.	119925.
CLASS I(TRIOXANE)	5	16.	307.	10	32.	615.	15	48.	922.
TOTAL CLASS I		1230.	40282.		2461.	80565.		3691.	120847.
CLASS VI(RAT SUPP)	5	116.	2952.	10	232.	5904.	15	349.	8856.
CLASS VIII(MED/DEN)		207.	3269.		8.	132.		215.	3401.
CLASS VIII(MED REPL)	5	39.	670.	10	79.	1341.	15	118.	2011.

ORGANIC WATER CARRYING CAPACITY FOR M1038

CONTAINER	GALLONS
5 GAL CANS	1950.
TOTAL ORGANIC CAPACITY	1950.

MOUNT OUT (WATER) FOR M1038

	GAL/MAN	TOT GAL
ORGANIC REQUIREMENT	3.00	3690.
ORGANIC CAPACITY		1950.
SUPPLEMENTARY CAPACITY REQUIRED		1740.

MOUNT OUT (CLASS II REPLENISHMENT, CLASS IV, CLASS IX AND CLASS X) FOR M1038

CATEGORY	******ORGN LOAD*******			****LANFOR SUPPLIES***			*********TOTAL********		
	DOS	CU FT	POUNDS	DOS	CU FT	POUNDS	DOS	CU FT	POUNDS
CLASS II* (TYPE I)	5	29.	318.	10	59.	635.	15	88.	953.
CLASS II* (TYPE 2 NON-CONSUMABLES)	5	0.	0.	10	0.	0.	15	0.	0.
TOTAL CLASS II*		29.	318.		59.	635.		88.	953.
CLASS IV	5	0.	0.	10	0.	0.	15	0.	0.
CLASS IX*	5	15.	353.	10	1451.	75758.	15	1466.	76112.
TOTAL		44.	671.		1510.	76393.		1554.	77064.

MOUNT OUT (CLASS III) FOR M1038

ORGANIZATIONAL LOAD

	**********5 GAL CANS*********				*****TANKERS*****			********55 GAL DRUMS*******			***DRY PACKAGES**	
	DOS	CANS	GALLONS	POUNDS	GALLONS	POUNDS	DRUMS	GALLONS	CU FT	POUNDS	CU FT	POUNDS
DIESEL	5	24.	120.	1079.	0.	0.	35.	1855.	385.	14857.		
MOGAS	5	102.	510.	4136.	0.	0.	136.	7208.	1496.	51381.		
JP	0				0.	0.	0.	0.	0.	0.		
KEROSENE	5	4.	20.	176.			3.	159.	33.	1243.		
LUBE (IIIW)	5						9.	486.	99.	4180.	0.	0.
LUBE (IIIA)	5						0.	0.	0.	0.		
CLASS IIIW (MARCORP)	5						0.	0.	0.	0.	20.	596.
TOTAL		130.	650.	5391.	0.	0.	183.	9708.	2013.	71661.	20.	596.

MOUNT OUT (CLASS III) FOR M1038

LANDING FORCE SUPPLIES

CATEGORY	***55 GAL DRUMS***					***BULK***				***DRY PACKAGES***		
	DOS	DRUMS	GALLONS	CU FT	POUNDS	DOS	GALLONS	CU FT	POUNDS	DOS	CU FT	POUNDS
DIESEL	2	18.	954.	198.	7641.	8	2735.	367.	19119.			
MOGAS	2	59.	3127.	649.	22290.	8	12190.	1633.	74481.			
JP	2	0.	0.	0.	0.	13	0.	0.	0.			
KEROSENE	2	6.	318.	66.	2486.	8	208.	28.	1420.			
LUBE (IIIW)	10	14.	756.	154.	6502.					10	0.	0.
LUBE (IIIA)	10	0.	0.	0.	0.							
CLASS IIIW (MARCORP)	10	0.	0.	0.	0.					10	39.	1193.
TOTAL		97.	5155.	1067.	38919.		15133.	2028.	95020.		39.	1193.

MOUNT OUT (CLASS VW) FOR M1038

TOTAL REQUIREMENT = BASIC ALLOWANCE PLUS 15 DOA

ORGANIZATIONAL LOAD = BASIC ALLOWANCE PLUS 5 DOA

MOUNT OUT (CLASS VW) FOR M1038

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	TOTAL RQRMT ROUNDS	ORGN LOAD RQRMT ROUNDS	***ORGN LOAD*** ROUNDS	PACKAGES	CU FT	POUNDS	EXCESS CARRIED ROUNDS	LANFOR SUPPLIES ROUNDS
I	0M456A	CORD DETONATING REI	4000.	9000.	7000.	16000.	4.	5.	228.	9000.	0.
I	0M626A	FIRING DEVICE DEMO	150.	54.	42.	600.	4.	11.	312.	558.	0.
I	0M627A	FIRING DEVICE DEMO	200.	108.	84.	800.	4.	5.	208.	716.	0.
I	0M630A	FIRING DEVICE DEMO	200.	54.	42.	800.	4.	8.	236.	758.	0.
I	0M670A	FUZE BLASTING TIME	4000.	7080.	6360.	16000.	4.	16.	376.	9640.	0.
I	0A131	CTG 7.62MM LINKED 4	800.	147000.	72333.	74400.	93.	74.	6979.	2067.	72600.
I	0A475	CTG CAL .45 BALL M1	2000.	10476.	7566.	14000.	7.	0.	791.	6434.	0.
I	0A068	CTG 5.56MM TRACER M	1640.	56280.	25013.	26240.	16.	26.	1073.	1227.	30040.
I	0A071	CTG 5.56MM BALL M19	1680.	590940.	372073.	378000.	225.	378.	16216.	5927.	212940.
I	0G803	ADAPTER GREN PROJ M	48.	8.	8.	192.	4.	12.	232.	184.	0.
I	0G806F	ADAPTER CHEM PROJ M	50.	59.	46.	200.	4.	8.	188.	154.	0.
I	0A574	CTG CAL.50 SPOTTER-	220.	1152.	512.	660.	3.	3.	219.	148.	492.
I	0G803A	ADAPTER GREN PROJ M	48.	26.	26.	48.	1.	3.	49.	22.	0.
I	0G806	ADAPTER CHEM GREN P	16.	4.	4.	16.	1.	1.	41.	12.	0.
I	0G806C	ADAPTER CHEM GREN P	50.	10.	10.	50.	1.	2.	47.	40.	0.
I	0G806D	ADAPTER CHEM GREN P	50.	10.	10.	50.	1.	2.	47.	40.	0.
I	0G806E	ADAPTER CHEM GREN P	50.	10.	10.	50.	1.	2.	47.	40.	0.
I	TOTAL							556.	27289.		
II-C	0G895	GREN HD ILLUM MK1 M	28.	100.	100.	112.	4.	5.	164.	12.	0.
II-C	0L495	FLARE SURFACE TRIP	32.	18064.	6064.	6144.	192.	449.	11136.	80.	11920.
II-C	0G940	GRENADE HAND SMOKE	16.	48.	48.	64.	4.	3.	136.	16.	0.
II-C	0G945	GRENADE HAND SMK YE	16.	48.	48.	64.	4.	3.	136.	16.	0.
II-C	0G950	GRENADE HAND SMK RE	16.	48.	48.	64.	4.	3.	136.	16.	0.
II-C	0L225	SIGNAL ILLUM A/C DS	80.	80.	80.	160.	2.	3.	114.	80.	0.
II-C	0L226	SIGNAL ILLUM A/C DS	80.	80.	80.	160.	2.	3.	110.	80.	0.
II-C	0L227	SIGNAL ILLUM A/C D	80.	80.	80.	160.	2.	3.	114.	80.	0.
II-C	0L306	SIGNAL ILLUM GRD RE	36.	36.	36.	72.	2.	3.	132.	36.	0.
II-C	0L307	SIGNAL ILLUM GRD WH	36.	36.	36.	72.	2.	3.	132.	36.	0.
II-C	0L311	SIGNAL ILLUM GRD RE	36.	36.	36.	72.	2.	3.	128.	36.	0.
II-C	0L312	SIGNAL ILLUM GRD WH	36.	72.	72.	108.	3.	4.	201.	36.	0.
II-C	0L314	SIGNAL ILLUM GRD GR	36.	36.	36.	72.	2.	3.	132.	36.	0.
II-C	0L323	SIGNAL SMK GRD RED	36.	36.	36.	72.	2.	3.	110.	36.	0.
II-C	0L324	SIGNAL SMK GRD GREE	36.	36.	36.	72.	2.	3.	110.	36.	0.

MOUNT OUT (CLASS VW) FOR M1038

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	TOTAL RQRMT ROUNDS	ORGN LOAD RQRMT ROUNDS	**************ORGN ROUNDS	PACKAGES	LOAD************* CU FT	POUNDS	EXCESS CARRIED ROUNDS	[illegible]
II-C	TOTAL							494.	12991.		
II-D	0H602	ROCKET SMK WP 3.5IN	3.	640.	240.	240.	80.	129.	4320.	0.	400.
II-D	08630	CTG 60MM SMK WP M30	9.	576.	216.	216.	24.	30.	1416.	0.	360.
II-D	0C276	CTG 81MM SMK WP M37	3.	588.	212.	213.	71.	75.	3621.	1.	375.
II-D	0G937	GREN HD AND RIFLE S	16.	128.	128.	144.	9.	6.	378.	16.	0.
II-D	TOTAL							239.	9735.		
II-E	0G930	GREN HD SMK HC AN-M	16.	59.	22.	32.	2.	2.	82.	10.	27.
II-E	TOTAL							2.	82.		
II-J	0G900	GREN HD INCENDIARY	16.	16.	16.	32.	2.	2.	94.	16.	0.
II-J	TOTAL							2.	94.		
IV	08568	CTG 40MM HE M406 W/	72.	2826.	1230.	1440.	20.	26.	1060.	210.	1345.
IV	08569	CTG 40MM HE M397 W/	72.	2034.	966.	1152.	16.	21.	848.	186.	882.
IV	0H600	ROCKET HEAT 3.5INCH	3.	2520.	920.	921.	307.	497.	17223.	1.	1599.
IV	08627	CTG 60MM ILLUM M83A	9.	1422.	522.	540.	60.	76.	4920.	18.	882.
IV	08632	CTG 60MM HE M49A2E1	12.	3708.	1404.	1440.	120.	121.	5880.	36.	2269.
IV	0H557A	ROCKET HEAT W/LCHR	15.	272.	173.	180.	12.	96.	1416.	7.	92.
IV	0G881	GREN HAND FRAG M67	30.	1205.	1202.	1320.	44.	69.	2288.	118.	0.
IV	0H557	ROCKET HEAT W/LCHR	15.	512.	281.	300.	20.	160.	2360.	19.	212.
IV	0C226	CTG 81MM ILLUM M301	3.	888.	312.	312.	104.	149.	6240.	0.	576.
IV	0C256	CTG 81MM HE M374 W/	3.	4464.	1584.	1584.	528.	756.	28037.	0.	2880.
IV	0C650	CTG 106MM HE, AT M3	2.	256.	96.	96.	48.	130.	5808.	0.	160.
IV	0C651	CTG 106MM HEP-T, M3	2.	600.	216.	216.	108.	280.	13068.	0.	384.
IV	0C660	CTG 106MM APERS-T -	2.	152.	56.	56.	28.	95.	3752.	0.	96.
IV	TOTAL							2474.	92899.		
VI	0N402	FUZE PROXIMITY, M53	16.	928.	352.	352.	22.	23.	968.	0.	576.
VI	TOTAL							23.	968.		
VIII	0M131A	CAP BLASTING NON--E	5000.	960.	440.	20000.	4.	780.	400.	19560.	0.
VIII	TOTAL							780.	400.		

MOUNT OUT (CLASS VW) FOR M1038

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	TOTAL RQRMT ROUNDS	ORGN LOAD RQRMT ROUNDS	ORGN LOAD ROUNDS	ORGN LOAD PACKAGES	ORGN LOAD CU FT	ORGN LOAD POUNDS	EXCESS CARRIED ROUNDS	LANFOR SUPPLIES ROUNDS
IX-B	0M757A	CHG ASSEMBLY DEMO M	2.	99.	57.	64.	32.	43.	1824.	7.	[illegible]
IX-B TOTAL								43.	1824.		
XI-B	0G924	GREN HD RIOT CSI M2	50.	300.	233.	400.	8.	14.	400.	167.	0.
XI-B	0G963	GREN HD RIOT CONTRO	16.	288.	224.	256.	16.	13.	560.	32.	32.
XI-B	0K768	CHEM AGENT RIOT CON	5.	35.	25.	25.	5.	200.	1250.	0.	10.
XI-B TOTAL								227.	2210.		
XI-D	0M766A	IGNITER TIME BLASTI	300.	984.	488.	1200.	4.	8.	225.	712.	0.
XI-D TOTAL								8.	225.		
TOTAL								4848.	148717.		

REPLENISHMENT RATE (BY DAYS) OF CLASSES I, II, IV, VI, VII(NON SQUARE), VIII, IX AND X
FOR M1038

CATEGORY	CU FT	POUNDS	SQ FT
CLASS I (A RATIONS)	147.	7380.	
CLASS I (B RATIONS)	143.	4664.	
CLASS I (MCI)	243.	7995.	
CLASS I (TRIOXANE)	3.	61.	
TOTAL CLASS I	536.	20101.	
CLASS IIW	6.	62.	
CLASS IV	0.	0.	
CLASS VI (RAT SUPP)	23.	590.	
CLASS VI (OTHER)	0.	0.	
CLASS VII (NON-SQUARE)	1.	9.	
CLASS VIII	5.	95.	
CLASS IXW (UNIT)	3.	71.	
CLASS IXW (SUPPORTING)	95.	5003.	
CLASS X	0.	0.	
TOTAL	669.	25931.	
CLASS VIIW (SQUARE)	13.	111.	3.
WATER(1 GAL/MAN/DAY) 5 GAL CANS	246.	11746.	
WATER(1 GAL/MAN/DAY) 2.5 GAL CANS	246.	10762.	

** THE REPLENISHMENT RATE IS FOR 1 DAYS

REPLENISHMENT RATE (PER DAY) OF CLASS III FOR M1038

CATEGORY	GALLONS	*******55 GAL DRUMS******* DRUMS	CU FT	POUNDS	******BULK******* CU FT	POUNDS	**DRY PACKAGES*** CU FT	POUNDS
DIESEL	369.	7.	77.	2955.	49.	2579.		
MOGAS	1532.	29.	318.	10918.	205.	9359.		
JP	0.	0.	0.	0.	0.	0.		
KEROSENE	33.	1.	7.	262.	4.	229.		
CLASS IIIW LUBE	68.	1.	14.	586.			0.	0.
CLASS IIIA LUBE	0.	0.	0.	0.				
CLASS IIIW (MARCORP)	0.	0.	0.	0.			4.	119.
TOTAL	2002.	38.	415.	14721.	259.	12166.	4.	119.

THE REPLENISHMENT QUANTITIES HAVE BEEN EXPRESSED IN BOTH DRUMS AND BULK TO PROVIDE DATA FOR EITHER MODE OF TRANSPORTATION

REPLENISHMENT SUSTAINING RATE (PER DAY) OF CLASS VW FOR M1038

DODIC	CG CLASS	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
0M131A	VIII	CAP BLASTING NON--ELEC S	5000.00	42.00	.01	1.64	.84
0M456A	I	CORD DETONATING REINF PL	4000.00	200.00	.05	.07	2.85
0M626A	I	FIRING DEVICE DEMO M1	150.00	.60	.00	.01	.31
0M627A	I	FIRING DEVICE DEMO M5	200.00	2.40	.01	.02	.62
0M630A	I	FIRING DEVICE DEMO M1 PU	200.00	.60	.00	.01	.18
0M670A	I	FUZE BLASTING TIME M700	4000.00	48.00	.01	.05	1.13
0M757A	IX-B	CHG ASSEMBLY DEMO M183	2.00	6.40	3.20	4.29	182.40
0M766A	XI-D	IGNITER TIME BLASTING FZ	300.00	38.00	.13	.25	7.13
0B568	IV	CTG 40MM HE M406 W/FZ PD	72.00	120.00	1.67	2.16	88.33
0B569	IV	CTG 40MM HE M397 W/FZ PD	72.00	79.20	1.10	1.43	58.30
0H600	IV	ROCKET HEAT 3.5INCH M28A	3.00	80.00	26.67	43.20	1496.00
0H602	II-D	ROCKET SMK WP 3.5INCH M3	3.00	20.00	6.67	10.74	360.00
0A131	I	CTG 7.62MM LINKED 4 BALL	800.00	4666.67	5.83	4.67	437.73
0B627	IV	CTG 60MM ILLUM M83A3 W/F	9.00	79.20	8.80	11.09	721.60
0B630	II-D	CTG 60MM SMK WP M302 W/F	9.00	28.80	3.20	3.95	188.80
0B632	IV	CTG 60MM HE M49A2E1 W/FZ	12.00	205.20	17.10	17.24	837.87
0A475	I	CTG CAL .45 BALL M1911	2000.00	145.50	.07	0.00	8.22
0A068	I	CTG 5.56MM TRACER M196	1640.00	1876.00	1.14	1.88	76.73
0A071	I	CTG 5.56MM BALL M193 10	1680.00	13132.00	7.82	13.13	563.36
0H557A	IV	ROCKET HEAT W/LCHR M72 S	15.00	9.88	.66	5.27	77.72
0G803	I	ADAPTER GREN PROJ M1A1 W	48.00	.01	.00	.00	.01
0G806F	I	ADAPTER CHEM PROJ M2A1	50.00	1.28	.03	.05	1.20
0G881	IV	GREN HAND FRAG M67 W/SAF	30.00	.29	.01	.02	.51
0G895	II-C	GREN HD ILLUM MK1 MOD-2	28.00	.00	.00	.00	.01
0G924	XI-B	GREN HD RIOT CS1 M25A2	50.00	6.67	.13	.24	6.67
0G963	XI-B	GREN HD RIOT CONTROL CS	16.00	6.40	.40	.32	14.00
0H557	IV	ROCKET HEAT W/LCHR M72 S	15.00	15.50	1.03	8.26	121.93
0L495	II-C	FLARE SURFACE TRIP M49	32.00	600.00	18.75	43.80	1087.50
0K768	XI-B	CHEM AGENT RIOT CONTROL	5.00	1.00	.20	8.00	50.00
0C226	IV	CTG 81MM ILLUM M301A3 W/	3.00	52.80	17.60	25.19	1056.00
0C256	IV	CTG 81MM HE M374 W/FZ PD	3.00	252.00	84.00	120.20	4460.40
0C276	II-D	CTG 81MM SMK WP M375 W/F	3.00	33.60	11.20	11.76	571.20
0N402	VI	FUZE PROXIMITY. M532	16.00	50.40	3.15	3.33	138.60
0A574	I	CTG CAL.50 SPOTTER-TRACE	220.00	64.00	.29	.26	21.24
0C650	IV	CTG 106MM HE. AT M344A1	2.00	16.00	8.00	21.68	968.00
0C651	IV	CTG 106MM HEP-T. M346. W	2.00	38.40	19.20	49.73	2323.20
0C660	IV	CTG 106MM APERS-T -BEEHI	2.00	9.60	4.80	16.32	643.20
0G803A	I	ADAPTER GREN PROJ M1A1 W	48.00	.00	.00	.00	.00
0G806	I	ADAPTER CHEM GREN PROJ M	16.00	.00	.00	.00	.00
0G806C	I	ADAPTER CHEM GREN PROJ M	50.00	.00	.00	.00	.00
0G806D	I	ADAPTER CHEM GREN PROJ M	50.00	.00	.00	.00	.00
0G806E	I	ADAPTER CHEM GREN PROJ M	50.00	.00	.00	.00	.00
0G900	II-J	GREN HD INCENDIARY TH-3	16.00	.00	.00	.00	.01
0G930	II-E	GREN HD SMK HC AN-M8	16.00	2.80	.17	.14	7.17
0G937	II-D	GREN HD AND RIFLE SMK WP	16.00	.02	.00	.00	.05

REPLENISHMENT SUSTAINING RATE (PER DAY) OF CLASS VW FOR M1038

DODIC	CG CLASS	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
0G940	II-C	GRENADE HAND SMOKE GREEN	16.00	.01	.00	.00	.02
0G945	II-C	GRENADE HAND SMK YELLOW	16.00	.01	.00	.00	.03
0G950	II-C	GRENADE HAND SMK RED M18	16.00	.01	.00	.00	.02
0L225	II-C	SICNAL ILLUM A/C DS RED-	80.00	.00	.00	.00	.00
0L226	II-C	SIGNAL ILLUM A/C DS YELL	80.00	.00	.00	.00	.00
0L227	II-C	SIGNAL ILLUM A/C DC GRE	80.00	.00	.00	.00	.00
0L306	II-C	SIGNAL ILLUM GRD RED SC	36.00	.00	.00	.00	.00
0L307	II-C	SIGNAL ILLUM GRD WHITE S	36.00	.00	.00	.00	.00
0L311	II-C	SIGNAL ILLUM GRD RED SC	36.00	.00	.00	.00	.00
0L312	II-C	SIGNAL ILLUM GRD WHITE S	36.00	.01	.00	.00	.02
0L314	II-C	SIGNAL ILLUM GRD GREEN S	36.00	.00	.00	.00	.00
0L323	II-C	SIGNAL SMK GRD RED PARAC	36.00	.00	.00	.00	.00
0L324	II-C	SIGNAL SMK GRD GREEN PAR	36.00	.00	.00	.00	.00
TOTAL						430.36	16581.17

BASIC ALLOWANCE OF CLASS VW FOR M1038

DODIC	CG CLASS	DESCRIPTION	ROUNDS
0M131A	VIII	CAP BLASTING NON--ELEC SPECIAL	180.
0M456A	I	CORD DETONATING REINF PLIO-FILM WRAPPED	6000.
0M626A	I	FIRING DEVICE DEMO M1	36.
0M627A	I	FIRING DEVICE DEMO M5	72.
0M630A	I	FIRING DEVICE DEMO M1 PULL	36.
0M670A	I	FUZE BLASTING TIME M700	6000.
0M757A	IX-B	CHG ASSEMBLY DEMO M183	36.
0M766A	XI-D	IGNITER TIME BLASTING FZ M60	240.
0B568	IV	CTG 40MM HE M406 W/FZ PD. M551	432.
0B569	IV	CTG 40MM HE M397 W/FZ PD. M536	432.
0H600	IV	ROCKET HEAT 3.5INCH M28A2 ROCKET HEA	120.
0H602	II-D	ROCKET SMK WP 3.5INCH M30	40.
0A131	I	CTG 7.62MM LINKED 4 BALL M80-1TRACER M62	35000.
0B627	IV	CTG 60MM ILLUM M83A3 W/FZ TIMEM65A1	72.
0B630	II-D	CTG 60MM SMK WP M302 W/FZ PD M527B1	36.
0B632	IV	CTG 60MM HE M49A2E1 W/FZ PD M525	252.
0A475	I	CTG CAL .45 BALL M1911	6111.
0A068	I	CTG 5.56MM TRACER M196 F/MARDIV.	9380.
0A071	I	CTG 5.56MM BALL M193 10 RD F/MARDIV.	262640.
0H557A	IV	ROCKET HEAT W/LCHR M72 SERIES M72 SERIS	123.
0G803	I	ADAPTER GREN PROJ M1A1 W/LAUNCHING CLIPS	8.
0G806F	I	ADAPTER CHEM PROJ M2A1 W/CLIPS	40.
0G881	IV	GREN HAND FRAG M67 W/SAFETY CLIP	1200.
0G895	II-C	GREN HD ILLUM MK1 MOD-2	100.
0G924	XI-B	GREN HD RIOT CSI M25A2	200.
0G963	XI-B	GREN HD RIOT CONTROL CS M1A3	192.
0H557	IV	ROCKET HEAT W/LCHR M72 SERIES M72 SERIES	165.
0L495	II-C	FLARE SURFACE TRIP M49	64.
0K768	XI-B	CHEM AGENT RIOT CONTROL CS1	20.
0C226	IV	CTG 81MM ILLUM M301A3 W/FZ TIME M84A1	24.
0C256	IV	CTG 81MM HE M374 W/FZ PD M524A5/M52	144.
0C276	II-D	CTG 81MM SMK WP M375 W/FZ PD M524A5/	24.
0N402	VI	FUZE PROXIMITY. M532	64.
0A574	I	CTG CAL.50 SPOTTER-TRACER. M48A1	192.
0C650	IV	CTG 106MM HE. AT M344A1 W/FZ PI-BD M509	16.
0C651	IV	CTG 106MM HEP-T. M346. W/FZ BD M91	24.
0C660	IV	CTG 106MM APERS-T -BEEHIVE- W/FZ MT XM59	8.
0G803A	I	ADAPTER GREN PROJ M1A1 W/LAUNCHING CLIPS	26.
0G806	I	ADAPTER CHEM GREN PROJ M2A1 W/LAUNCHING	4.
0G806C	I	ADAPTER CHEM GREN PROJ M2A1 W/CLIPS	10.
0G806D	I	ADAPTER CHEM GREN PROJ M2A1 W/CLIPS	10.
0G806E	I	ADAPTER CHEM GREN PROJ M2A1 W/CLIPS	10.
0G900	II-J	GREN HD INCENDIARY TH-3 AN-M14	16.
0G930	II-E	GREN HD SMK HC AN-M8	4.
0G937	II-D	GREN HD AND RIFLE SMK WP M34	128.
0G940	II-C	GRENADE HAND SMOKE GREEN M18	48.
0G945	II-C	GRENADE HAND SMK YELLOW M18	48.

BASIC ALLOWANCE OF CLASS VW FOR M1038

DODIC	CG CLASS	DESCRIPTION	ROUNDS
0G950	II-C	GRENADE HAND SMK RED M18	48.
0L225	II-C	SIGNAL ILLUM A/C DS RED-RED AN-M37A2	80.
0L226	II-C	SIGNAL ILLUM A/C DS YELLOW-YELLOW AN-M38	80.
0L227	II-C	SIGNAL ILLUM A/C DC GREEN-GREEN AN-M39A	80.
0L306	II-C	SIGNAL ILLUM GRD RED SC M158	36.
0L307	II-C	SIGNAL ILLUM GRD WHITE SC M159	36.
0L311	II-C	SIGNAL ILLUM GRD RED SC M126A1	36.
0L312	II-C	SIGNAL ILLUM GRD WHITE STAR PARACHUTE M1	72.
0L314	II-C	SIGNAL ILLUM GRD GREEN SC M125	36.
0L323	II-C	SIGNAL SMK GRD RED PARACHUTE M129	36.
0L324	II-C	SIGNAL SMK GRD GREEN PARACHUTEM128A1	36.

MOUNT OUT (REPLENISHMENT) OF MAJOR EQUIPMENT FOR M1038

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	*******MOUNT OUT REQUIREMENT******* QUANTITY	SQ FT	CU FT	POUNDS	ORGN LOAD QUANTITY	LANFOR SUPPLIES QUANTITY
CLASS VIIW (TYPE 1)									
	A1900	02474A	RADIO SET,AN/MR	0.	0.	0.	0.	0.	0.
	A1910	02903A	RADIO SET,AN/MR	0.	0.	0.	0.	0.	0.
	A1920	04660A	RADIO SET, AN/M	0.	0.	0.	0.	0.	0.
	A2192	07272A	RADIO TERMINAL	0.	0.	0.	0.	0.	0.
	D0840	04469B	TRAILER, AMPHIB	0.	0.	0.	0.	0.	0.
	D1020	05999A	TRUCK, CARGO, 1	0.	0.	0.	0.	0.	0.
	D1100	01118E	TRUCK, PLATFORM	0.	0.	0.	0.	0.	0.
	D1160	04751A	TRUCK, UTILITY,	0.	0.	0.	0.	0.	0.
	E1480	03328B	RIFLE, 106MM, M	0.	0.	0.	0.	0.	0.
CLASS VIIW (TYPE 3)									
TOTAL CLASS VIIW					0.	0.	0.		
ORGN LOAD					0.	0.	0.		
LANFOR SUPPLIES					0.	0.	0.		

MOUNT OUT (REPLENISHMENT) OF MAJOR EQUIPMENT FOR M1038

NON-SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	*******MOUNT OUT REQUIREMENT******* QUANTITY	SQ FT	CU FT	POUNDS	ORGN LOAD QUANTITY	LANFOR SUPPLY QUANTITY
CLASS VIIW (TYbE 1+2)									
	A1083	05975C	NIGHT VISION SI	1.		1.	13.	0.	
	E1060	04706A	MORTAR, INFANTR	0.		0.	0.	0.	
	A0005	04177A	ACCESSORY KIT.	0.		0.	0.	0.	
	A0328	06692A	CONVERTER FREQU	0.		0.	0.	0.	
	A0490	04704B	DETECTING SET.	1.		1.	12.	0.	
	A0922	03449A	METASCOPE, ASSE	0.		0.	0.	0.	
	A1086		NIGHT VISION SI	0.		0.	0.	0.	
	A1087	07098A	NIGHT VISION SI	0.		0.	0.	0.	
	A1420	05867A	RADAR SET AN/PP	0.		0.	0.	0.	
	A1730	04616A	RADIO SET,CONTR	0.		0.	0.	0.	
	A2010	03816A	RADIO SET, AN/P	0.		0.	0.	0.	
	A2020	03817A	RADIO SET, AN/P	0.		0.	0.	0.	
	A2040	06828A	RADIO SET AN/PR	0.		0.	0.	0.	
	A2050	05916A	RADIO SET, AN/P	1.		1.	20.	0.	
	A2150	04622A	RADIO SET, AN/V	0.		0.	0.	0.	
	A2184	07277A	RADIO TERMINAL	0.		0.	0.	0.	
	A2240	05866A	RECEIVING SET R	0.		0.	0.	0.	
	A2480	00276A	SWITCHBOARD, TE	0.		0.	0.	0.	
	A2660	00041A	TELETYPEWRITER	0.		0.	0.	0.	
	A2685	06963A	TERMINAL, TELEG	0.		0.	0.	0.	
	B1360	03965A	MOTOR GENERATOR	0.		0.	0.	0.	
	E0180	00476A	CIRCLE,AIMING,M	0.		0.	0.	0.	
	E1090	00519A	MORTAR,INF,81MM	0.		0.	0.	0.	
	E1260	02193A	QUADRANT, FIRE	0.		0.	0.	0.	
	E1900	00591A	TELESCOPE, OBSE	0.		0.	0.	0.	
	H2357	04626A	POWER SUPPLY, P	0.		0.	0.	0.	
	H2363	02543A	PUBLIC ADDRESS	0.		0.	0.	0.	
	H2443	02336A	TELEPHONE SET,	0.		0.	0.	0.	
CLASS VIIW (TYPE 3)									
TOTAL CLASS VIIW						3.	45.		
ORGN LOAD						0.	0.		
LANFOR SUPPLIES						3.	45.		

ASSAULT ECHELON REPLENISHMENT CARGO

(CLASSES I, II, IV, VI, VII NON-SQUARE, VIII AND IX)

CARRIED BY FOLLOW ON ECHELON FOR M1038

CATEGORY	DOS	CU FT	POUNDS	SQ FT
CLASS I (A RATIONS)	0	0.	0.	
CLASS I (B RATIONS)	0	0.	0.	
CLASS I (MCI)	45	10932.	359775.	
CLASS I (TRIOXANE)	45	143.	2767.	
TOTAL CLASS I		11074.	362542.	
CLASS IIW	45	260.	2803.	
CLASS IV	45	0.	0.	
CLASS VI (RAT SUPP)	45	1046.	26568.	
CLASS VI (OTHER)	45	0.	0.	
CLASS VIIW (NON-SQUARE)	45	85.	342.	
CLASS VIII	45	325.	5455.	
CLASS IXW (UNIT)	45	131.	3181.	
CLASS IXW (SUPPORTING)	45	4266.	225154.	
CLASS X	45	0.	0.	
TOTAL		17188.	626045.	
CLASS VIIW (SQUARE)	45	504.	3720.	124.

ASSAULT ECHELON CLASS III CARRIED BY THE FOLLOW ON ECHELON FOR M1038

		************55 GAL DRUMS***********				***********BULK***********			***DRY PACKAGES**	
CATEGORY	DOS	DRUMS	GALLONS	CU FT	POUNDS	GALLONS	CU FT	POUNDS	CU FT	POUNDS
DIESEL	45	0.	0.	0.	0.	16601.	2225.	116044.		
MOGAS	45	0.	0.	0.	0.	68926.	9236.	421141.		
JP	45	0.	0.	0.	0.	0.	0.	0.		
KEROSENE	45	0.	0.	0.	0.	1507.	202.	10290.		
LUBE (IIIW)	45	61.	3294.	671.	28328.				0.	0.
LUBE (IIIA)	45	0.	0.	0.	0.					
CLASS IIIW (MARCORP)	45	0.	0.	0.	0.				176.	5367.
TOTAL		61.	3294.	671.	28328.	87034.	11663.	547474.	176.	5367.

ASSAULT ECHELON CLASS VW CARRIED BY THE FOLLOW ON ECHELON FOR M1038

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
I	0M456A	CORD DETONATING REINF PLIO-FIL	4000.	2000.	0.	1.	28.
I	0A131	CTG 7.62MM LINKED 4 BALL M80-1	800.	252000.	315.	252.	23638.
I	0A068	CTG 5.56MM TRACER M196	1640.	103180.	63.	103.	4220.
I	0A071	CTG 5.56MM BALL M193 10 RD	1680.	722260.	430.	722.	30985.
I	0A475	CTG CAL .45 BALL M1911	2000.	5370.	3.	0.	303.
I	0A574	CTG CAL.50 SPOTTER-TRACER.	220.	2880.	13.	12.	956.
I	TOTAL					1090.	60130.
II-C	0L495	FLARE SURFACE TRIP M49	32.	36000.	1125.	2628.	65250.
II-C	TOTAL					2628.	65250.
II-D	0H602	ROCKET SMK WP 3.5INCH M30	3.	1200.	400.	644.	21600.
II-D	0B630	CTG 60MM SMK WP M302 W/FZ PD	9.	1404.	156.	192.	9204.
II-D	0C276	CTG 81MM SMK WP M375 W/FZ	3.	1572.	524.	550.	26724.
II-D	TOTAL					1387.	57528.
II-E	0G930	GREN HD SMK HC AN-M8	16.	139.	9.	7.	357.
II-E	TOTAL					7.	357.
IV	0B568	CTG 40MM HE M406 W/FZ PD. M551	72.	5994.	83.	108.	4412.
IV	0B569	CTG 40MM HE M397 W/FZ PD. M536	72.	3978.	55.	72.	2928.
IV	0H600	ROCKET HEAT 3.5INCH M28A2	3.	4800.	1600.	2592.	89760.
IV	0B627	CTG 60MM ILLUM M83A3 W/FZ TIME	9.	3726.	414.	522.	33948.
IV	0B632	CTG 60MM HE M49A2E1 W/FZ PD	12.	9612.	801.	807.	39249.
IV	0H557A	ROCKET HEAT W/LCHR M72 SERIES	15.	445.	30.	237.	3498.
IV	0H557	ROCKET HEAT W/LCHR M72 SERIES	15.	812.	54.	433.	6392.
IV	0C226	CTG 81MM ILLUM M301A3 W/FZ	3.	2448.	816.	1168.	48960.
IV	0C256	CTG 81MM HE M374 W/FZ PD	3.	11880.	3960.	5667.	210276.
IV	0C650	CTG 106MM HE. AT M344A1 W/FZ	2.	720.	360.	976.	43560.
IV	0C651	CTG 106MM HEP-T. M346. W/FZ	2.	1728.	864.	2238.	104544.
IV	0C660	CTG 106MM APERS-T -BEEHIVE- W/	2.	432.	216.	734.	28944.
IV	TOTAL					15553.	616470.
VI	0N402	FUZE PROXIMITY. M532	16.	2376.	148.	157.	6534.

ASSAULT ECHELON CLASS VW CARRIED BY THE FOLLOW ON ECHELON FOR M1038

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
VI	TOTAL					157.	6534.
IX-B	0M757A	CHG ASSEMBLY DEMO M183	2.	255.	127.	171.	7267.
IX-B	TOTAL					171.	7267.
XI-B	0G924	GREN HD RIOT CSI M25A2	50.	200.	4.	7.	200.
XI-B	0G963	GREN HD RIOT CONTROL CS M1A3	16.	288.	18.	14.	630.
XI-B	0K768	CHEM AGENT RIOT CONTROL CSI	5.	45.	9.	360.	2250.
XI-B	TOTAL					382.	3080.
XI-D	0M766A	IGNITER TIME BLASTING FZ M60	300.	1668.	6.	11.	313.
XI-D	TOTAL					11.	313.
TOTAL						21385.	816930.

ASSAULT ECHELON REPLENISHMENT CLASS VII(SQUARE LOADED) CARRIED BY THE FOLLOW ON ECHELON FOR M1038

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	SQ FT	CU FT	POUNDS
CLASS VII.						
	A1900	02474A	RADIO SET,AN/MRG-83,TRK MTD	0.	0.	0.
	A1910	02903A	RADIO SET,AN/MRC-87,TRK MTD	0.	0.	0.
	A1920	04660A	RADIO SET, AN/MRC-109, MTD IN	0.	0.	0.
	A2182	07272A	RADIO TERMINAL SET, AN/MRC-134	0.	0.	0.
	D0840	04469B	TRAILER, AMPHIB CARGO, 1/4T, 2	0.	0.	0.
	D1020	05989A	TRUCK, CARGO, 1-1/4T, 6X6, M56	0.	0.	0.
	D1100	01118E	TRUCK, PLATFORM, UTILITY, 1/2T	18.	42.	900.
	D1160	04751A	TRUCK, UTILITY, 1/4T M151A1-	61.	327.	2400.
	E1480	03328B	RIFLE, 106MM, M40A1C, W/E -MT	45.	135.	420.
TOTAL CLASS VII*				124.	504.	3720.

PERSONNEL INDIVIDUAL LOADS FOR M1038

CATEGORY	CU FT	POUNDS
CLASS I (MCI)	243.	7995.
CLASS II (INDIVIDUAL WEAPONS)	579.	10083.
CLASS II (CREW SERVED WEAPONS)	45.	840.
CLASS II (ORGANIZATIONAL EQUIPMENT)	1932.	25081.
CLASS VII (CREW SERVED WEAPONS)	0.	0.
CLASS VII (ORGANIZATIONAL EQUIPMENT)	0.	0.
TOTAL	2799.	44000.

MOBILE LOADED CARGO FOR M1038

CATEGORY	GAL	SQ FT	CU FT	POUNDS	****UTILIZED***** ****CAPACITY***** CU FT	POUNDS
CLASS I			255.	8399.	0.	404.
CLASS II			2576.	36329.	6.	324.
CLASS III DIESEL	0.		0.	0.	0.	0.
CLASS III MOGAS	0.		0.	0.	0.	0.
CLASS III JP	0.		0.	0.	0.	0.
CLASS III KEROSENE	0.		0.	0.	0.	0.
CLASS IIIW LUBE	0.		0.	0.	0.	0.
CLASS IIIA LUBE	0.		0.	0.	0.	0.
CLASS IIIW (MARCORP)	0.		0.	0.	0.	0.
CLASS IV			0.	0.	0.	0.
CLASS VW			715.	26500.	1029.	26500.
CLASS VA			0.	0.	0.	0.
CLASS VZ			0.	0.	0.	0.
CLASS VI			0.	0.	0.	0.
CLASS VII NML(SQ)		0.	0.	0.	0.	0.
OTHER CLASS VII (NON-SQUARE)			1152.	11340.	552.	9272.
CLASS VIII			0.	0.	0.	0.
CLASS IXW			0.	0.	0.	0.
CLASS IXA			0.	0.	0.	0.
CLASS IXZ			0.	0.	0.	0.
CLASS X			0.	0.	0.	0.
TOTAL		0.	4698.	82568.	1587.	36500.

MOBILE LOADED CARGO SUMMARY FOR M1038

	CU FT	POUNDS
MOBILE LOAD CAPACITY	1587.	44000.
MOBILE LOADED CARGO	4698.	82568.
UNUSED CAPACITY	0.	7500.
NON-MOBILE LOADED CARGO	66865.	1329236.

GENERAL CARGO FOR M1038

CATEGORY	GAL	SQ FT	CU FT	POUNDS
CLASS I			3436.	112448.
CLASS II			22462.	322038.
CLASS III DIESEL	5664.		974.	42696.
CLASS III MOGAS	23035.		3880.	152288.
CLASS III JP	0.		0.	0.
CLASS III KEROSENE	705.		131.	5325.
CLASS IIIW LUBE	1242.		253.	10681.
CLASS IIIA LUBE	0.		0.	0.
CLASS IIIW (MARCORP)	0.		59.	1789.
CLASS IV			15.	245.
CLASS VW			9766.	333442.
CLASS VA			0.	0.
CLASS VZ			0.	0.
CLASS VI			349.	8856.
CLASS VII NON-SQUARE			969.	8377.
CLASS VIII			333.	5412.
CLASS IXW			2931.	152223.
CLASS IXA			0.	0.
CLASS IXZ			0.	0.
CLASS X			0.	0.
TOTAL			45558.	1155822.
CLASS VII SQUARE		4717.	21307.	173414.

READ AN INPUT CARD. CARD IS...ASSAULT ECHELON COMPONENT = 1 M8937X 3PNAA

T/O DESIGNATOR M8937X

NAME

COMPONENT OF

CONSISTING OF UNIT NAME TOTAL FOR COMPONENT
M8937X 1

SYSTEM NAME C6682 DOES NOT EXIST.
SYSTEM NAME C2330 DOES NOT EXIST.
SYSTEM NAME C3255 DOES NOT EXIST.
SYSTEM NAME C3340 DOES NOT EXIST.
SYSTEM NAME C3430 DOES NOT EXIST.

PERSONNEL	OFFICER	ENLISTED	TOTAL
MARCORP	49	188	237
NAVY	1	3	4
GRAND TOTAL	50	191	241

INITIAL ISSUE OF MAJOR EQUIPMENT FOR M8937X

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	SQ FT	LBS	NML	******CARGO****** CU FT	[illegible]
WEAPONS(CLASS VII*)									
OTHER CLASS VII* (T/E TYPE 1)									
	B0630	00903K	FLOODLIGHT SET, ELEC	1.	76.	2680.	NO	0.	0
	D0080	05945A	CHASSIS, TRAILER, 3	1.	125.	2650.	NO	0.	7000
	D0840	04469B	TRAILER, AMPHIB CARG	2.	92.	1140.	NO	62.	1000
	D1160	04751A	TRUCK, UTILITY, 1/4T	4.	244.	9600.	NO	0.	2000
	D1186	07064A	TRUCK, UTILITY, 1-1/	4.	496.	21840.	NO	544.	10000
CLASS VII* TOTAL (T/E TYPE 1)					1033.	37910.		606.	20000
OTHER CLASS VII* (T/E TYPE 3)									
TOTAL CLASS VII*					1033.	37910.		606.	20000

INITIAL ISSUE PLUS MOUNT OUT (90 DAYS) OF MAJOR EQUIPMENT FOR M8937X

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	****TOTAL***** SQ FT	LBS	NML	******[illegible] CU FT	
HELICOPTERS OV10A AND VSTOL									
	3CH46FX		CH46F	18.	12222.	282600.	NO	15552.	100[illegible]
OTHER CLASS VIIA									
	MMF.CN1		MMF.COMNAV NO 1	1.	160.	4500.	NO	0.	0
	MMF.CN2		MMF.COMNAV NO 2	1.	160.	4500.	NO	0.	0
	MMF.EL1		MMF.ELECTRICAL NO 1	1.	160.	4500.	NO	0.	0
	MMF.EL2		MMF.ELECTRICAL NO 2	1.	160.	4500.	NO	0.	0
	17300750627		ADAPTER-FWD TRANSMIS	2.	48.	350.	NO	0.	0
	17300750629		ADAPTER-VERTICAL SHA	1.	27.	280.	NO	0.	0
	17301121024		ADAPTER-XMSN AND MIX	1.	28.	300.	NO	0.	0
	17302948883		MAINTENANCE PLATFORM	3.	135.	2160.	NO	0.	0
	43107280206		COMPRESSOR-AIR 100 P	2.	118.	7600.	NO	0.	0
	43107987641		COMPRESSOR-AIR PORTA	1.	5.	273.	NO	0.	0
	49401682173		BLAST CLEANING MACHI	3.	21.	525.	NO	0.	0
	49407821630		CLEANING MACHINE-AIR	1.	32.	1000.	NO	0.	0
	61157826740		MOBILE ELECTRIC POWE	1.	45.	6600.	NO	0.	0
	17400623100		TRAILER-ENGINE TRANS	1.	36.	800.	NO	0.	0
	49401312518		CLEANER-STEAM PRESSU	1.	13.	500.	NO	0.	0
	66355809892		PORTABLE MAGNETIC IN	1.	8.	952.	NO	0.	0
LANDING CRAFT AND FLOATING EQUIPMENT									
OTHER CLASS VIIZ									
TOTAL					13378.	321940.		15552.	100800
TOTAL (-) A/C, L/C AND FLOATING EQUIPMENT					1156.	39340.		0.	0

INITIAL ISSUE OF MAJOR EQUIPMENT FOR M8937X

NON-SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	****TOTAL***** CU FT	LBS
ORGANIZATIONAL WPNS						
OTHER CLASS VIIW						
	A0870	00042A	INTERCOMMUNICATION S	1.	7.	182.
	A2480	00276A	SWITCHBOARD, TELEPHO	1.	1.	28.
TOTAL NON-SQUARE LOADED					8.	210.

INITIAL ISSUE PLUS MOUNT OUT (90 DAYS) OF MAJOR EQUIPMENT FOR M8937X

NON-SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	QTY	****TOTAL***** CU FT	LBS
CLASS VIIA						
	17307577232		CRANE-MAINTENANCE	2.	150.	812.
	49200978842		ANALYZER-ATTITUDE	2.	2.	2.
	49201344689		INSPECTION SET-PROPE	2.	12.	36.
	49209563772		TEST DEVICE-DE-ICING	2.	6.	68.
	66250577453		TEST SET RADIO	2.	4.	144.
	49201653973		TEST TRAILER ASSY-	1.	1.	1.
	66250633271		TEST SET RADAR ALTIM	1.	8.	148.
	66251337853		TEST SET RADIO	2.	22.	1620.
	66252642249		RADAR TEST SET	1.	9.	190.
	66254898667		TEST HARNESS-RADAR	1.	3.	60.
CLASS VIIZ						
TOTAL NON-SQUARE LOADED					217.	3081.

INITIAL ISSUE OF SECONDARY EQUIPMENT AND SUPPLIES FOR M8937X

CATEGORY	CU FT	POUNDS
CLASS IIW (TYPE 1)	3752.	52105.
TOTAL CLASS IIW	3752.	52105.
TOTAL CLASS IV	0.	0.
TOTAL INITIAL ISSUE	3752.	52105.

* NON-CONSUMABLES ONLY

INITIAL ISSUE PLUS MOUNT OUT (90 DAYS) OF SECONDARY EQUIPMENT AND SUPPLIES FOR M8937X

CATEGORY	CU FT	POUNDS
CLASS IIA	38663.	1036104.
CLASS IXA	2490.	37500.
TOTAL	41153.	1073604.

OPERATING STOCKS OF M8937X

CATEGORY	CU FT	POUNDS
CLASS IXW	0.	0.
TOTAL	0.	0.

TOTAL INITIAL ALLOWANCE FOR M8937X

CATEGORY	CU FT	POUNDS
TOTAL INITIAL ALLOWANCE	234939.	1488850.
NML INITIAL ALLOWANCE	1677.	26455.
TOTAL INITIAL ALLOWANCE - (NML)	233261.	1488850.

INITIAL ISSUE OF WEAPONS FOR M8937X

CATEGORY	CONTROL NUMBER OR FSN.	ID	SUPPLY CLASS	DESCRIPTION	QUANTITY
ORGANIZATIONAL WPNS SQUARE LOADED					
ORGANIZATIONAL WPNS NON-SQUARE LOADED					
INDIVIDUAL WEAPONS					
	E1180	00526A	CL II	PISTOL, AUTO, CAL 45, M1911A1,	44.
	E1400	00538A	CL II	REVOLVER, CAL 38, S AND W, W/E	43.
	E1440	05538A	CL II	RIFLE, 5.56MM, M16A1, W/E	154.

MOUNT OUT (CLASS I. CLASS VI. AND CLASS VIII) FOR M8937X

CATEGORY	*******ORGN LOAD******			***LANFOR SUPPLIES***			********TOTAL********		
	DOS	CU FT	POUNDS	DOS	CU FT	POUNDS	DOS	CU FT	POUNDS
CLASS I(A RATIONS)	0	0.	0.	0	0.	0.	0	0.	0.
CLASS I(B RATIONS)	0	0.	0.	0	0.	0.	0	0.	0.
CLASS I(MCI)	5	238.	7832.	10	476.	15665.	15	714.	23497.
CLASS I(TRIOXANE)	5	3.	60.	10	6.	120.	15	9.	181.
TOTAL CLASS I		241.	7893.		482.	15785.		723.	23678.
CLASS VI(RAT SUPP)	5	23.	578.	10	46.	1157.	15	68.	1735.
CLASS VIII(MED/DEN)		120.	2117.		2.	26.		122.	2143.
CLASS VIII(MED REPL)	5	8.	131.	10	15.	263.	15	23.	394.

ORGANIC WATER CARRYING CAPACITY FOR M8937X

CONTAINER	GALLONS
5 GAL CANS	590.
TOTAL ORGANIC CAPACITY	590.

MOUNT OUT (WATER) FOR M8937X

	GAL/MAN	TOT GAL
ORGANIC REQUIREMENT	3.00	723.
ORGANIC CAPACITY		590.
SUPPLEMENTARY CAPACITY REQUIRED		133.

MOUNT OUT (CLASS II REPLENISHMENT, CLASS IV, CLASS IX AND CLASS X) FOR M8737X

CATEGORY	ORGN LOAD DOS	ORGN LOAD CU FT	ORGN LOAD POUNDS	LANFOR SUPPLIES DOS	LANFOR SUPPLIES CU FT	LANFOR SUPPLIES POUNDS	TOTAL DOS	TOTAL CU FT	TOTAL POUNDS
CLASS II* (TYPE 1)	5	7.	122.	10	13.	244.	15	20.	366.
TOTAL CLASS II*		7.	122.		13.	244.		20.	366.
CLASS IX*	5	3.	109.	10	13.	655.	15	16.	763.
TOTAL		10.	231.		27.	899.		36.	1129.

MOUNT OUT (CLASS III) FOR M8937X

ORGANIZATIONAL LOAD

	*********5 GAL CANS*********				*****TANKERS*****			*******55 GAL DRUMS*******			***DRY PACKAGES**	
	DOS	CANS	GALLONS	POUNDS	GALLONS	POUNDS	DRUMS	GALLONS	CU FT	POUNDS	CU FT	POUNDS
DIESEL	5	0.	0.	0.	0.	0.	26.	1378.	286.	11037.		
MOGAS	5	0.	0.	0.	0.	0.	15.	795.	165.	5667.		
JP	0				0.	0.	0.	0.	0.	0.		
KEROSENE	5	0.	0.	0.			1.	53.	11.	414.		
LUBE (IIIW)	5						2.	108.	22.	929.	0.	0.
LUBE (IIIA)	5						1.	54.	11.	469.		
CLASS IIIW (MARCORP)	5						0.	0.	0.	0.	3.	105.
TOTAL		0.	0.	0.	0.	0.	45.	2388.	495.	18516.	3.	105.

MOUNT OUT (CLASS III) FOR M8937X

LANDING FORCE SUPPLIES

CATEGORY	55 GAL DRUMS DOS	DRUMS	GALLONS	CU FT	POUNDS	BULK DOS	GALLONS	CU FT	POUNDS	DRY PACKAGES DOS	CU FT	POUNDS
DIESEL	2	11.	583.	121.	4669.	8	2072.	278.	14481.			
MOGAS	2	6.	318.	66.	2267.	8	1233.	165.	7532.			
JP	2	248.	13144.	2728.	103168.	13	85336.	11435.	580283.			
KEROSENE	2	1.	53.	11.	414.	8	0.	0.	0.			
LUBE (IIIW)	10	4.	216.	44.	1858.					10	0.	0.
LUBE (IIIA)	10	1.	54.	11.	469.							
CLASS IIIW (MARCORP)	10	0.	0.	0.	0.					10	7.	210.
TOTAL		271.	14368.	2981.	112845.		88640.	11878.	602296.		7.	210.

MOUNT OUT (CLASS VW) FOR M8937X

TOTAL REQUIREMENT = BASIC ALLOWANCE PLUS 15 DOA

ORGANIZATIONAL LOAD = BASIC ALLOWANCE PLUS 5 DOA

MOUNT OUT (CLASS VW) FOR M8937X

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	TOTAL RQRMT ROUNDS	ORGN LOAD RQRMT ROUNDS	*************ORGN LOAD************* ROUNDS	PACKAGES	CU FT	POUNDS	EXCESS CARRIED ROUNDS	LANFOR SUPPLIES ROUNDS
I	0A475	CTG CAL .45 BALL M1	2000.	1584.	1144.	2000.	1.	0.	113.	856.	0.
I	0A400	CTG CAL .38 SPECIAL	2400.	1075.	645.	2400.	1.	1.	92.	1755.	0.
I	0A068A	CTG 5.56MM TRACER M	1640.	3080.	2053.	3280.	2.	2.	120.	1227.	0.
I	0A071A	CTG 5.56MM BALL M19	1680.	64680.	50307.	50400.	30.	36.	2400.	93.	14280.
I	0G841	CTG RIFLE GRENADE 5	2080.	462.	359.	2080.	1.	0.	56.	1721.	0.
I	0G803A	ADAPTER GREN PROJ M	48.	7.	7.	48.	1.	3.	49.	41.	0.
I	TOTAL							42.	2830.		
II-D	0G937	GREN HD AND RIFLE S	16.	32.	32.	48.	3.	2.	126.	16.	0.
II-D	TOTAL							2.	126.		
IV	0H557B	ROCKET HEAT W/LCHR	15.	24.	16.	30.	2.	16.	236.	14.	0.
IV	TOTAL							16.	236.		
TOTAL								60.	3192.		

MOUNT OUT (CLASS VA) FOR M8937X

TOTAL REQUIREMENT ORGANIZATIONAL LOAD

MOUNT OUT (CLASS VA) FOR M8937X

CG CLASS	DODIC	DESCRIPTION	ITEMS PER PACKAGE ITEMS	TOTAL RQRMT ITEMS	TOTAL LOAD RQRMT ITEMS	**********ORGN LOAD************* ITEMS	PACKAGES	CU FT	POUNDS	EXCESS CARRIED SUPPLIES ITEMS	LANFOR SUPPLIES ITEMS
SPEC	AVORDCUCH46F	AVIATION ORDNANCE C	1.	1512.	504.	504.	504.	504.	0.	0.	1008.
SPEC	AVORDWTCH46F	AVIATION ORDNANCE W	1.	91800.	30600.	30600.	30600.	0.	30600.	0.	61200.
SPEC TOTAL								504.	30600.		
TOTAL								504.	30600.		

REPLENISHMENT RATE (BY DAYS) OF CLASSES I, II, IV, VI, VII(NON SQUARE), VIII, IX AND X
FOR MH937X

CATEGORY	CU FT	POUNDS	SQ FT
CLASS I (A RATIONS)	29.	1446.	
CLASS I (B RATIONS)	28.	914.	
CLASS I (MCI)	48.	1566.	
CLASS I (TRIOXANE)	1.	12.	
TOTAL CLASS I	105.	3938.	
CLASS IIW	1.	15.	
CLASS IV	0.	0.	
CLASS VI (RAT SUPP)	5.	116.	
CLASS VI (OTHER)	0.	0.	
CLASS VII (NON-SQUARE)	0.	0.	
CLASS VIII	1.	19.	
CLASS IXW (UNIT)	1.	22.	
CLASS IXW (SUPPORTING)	0.	29.	
CLASS X	0.	0.	
TOTAL	113.	4139.	
CLASS VIIW (SQUARE)	2.	10.	0.
WATER(1 GAL/MAN/DAY) 5 GAL CANS	49.	2340.	
WATER(1 GAL/MAN/DAY) 2.5 GAL CANS	48.	2122.	

** THE REPLENISHMENT RATE IS FOR 1 DAYS

REPLENISHMENT RATE (PER DAY) OF CLASS III FOR M8937X

CATEGORY	GALLONS	*******55 GAL DRUMS******* DRUMS	CU FT	POUNDS	******BULK******* CU FT	POUNDS	**DRY PACKAGES*** CU FT	POUNDS
DIESEL	265.	5.	55.	2126.	36.	1856.		
MOGAS	155.	3.	32.	1105.	21.	948.		
JP	6565.	124.	1363.	51532.	880.	44644.		
KEROSENE	2.	0.	0.	15.	0.	13.		
CLASS IIIW LUBE	17.	0.	4.	148.			0.	0.
CLASS IIIA LUBE	3.	0.	1.	28.				
CLASS IIIW (MARCORP)	0.	0.	0.	0.			1.	21.
TOTAL	7008.	132.	1454.	54955.	936.	47461.	1.	21.

THE REPLENISHMENT QUANTITIES HAVE BEEN EXPRESSED IN BOTH DRUMS AND BULK TO PROVIDE DATA FOR EITHER MODE OF TRANSPORTATION

REPLENISHMENT SUSTAINING RATE (PER DAY) OF CLASS VW FOR M8937X

DODIC	CG. CLASS	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
0A475	I	CTG CAL .45 BALL M1911	2000.00	22.00	.01	0.00	1.24
0A400	I	CTG CAL .38 SPECIAL BALL	2400.00	21.50	.01	.01	.82
0A068A	I	CTG 5.56MM TRACER M196	1640.00	102.67	.06	.06	3.76
0A071A	I	CTG 5.56MM BALL M193 10-	1680.00	718.67	.43	.51	34.22
0G841	I	CTG RIFLE GRENADE 5.56MM	2080.00	10.27	.00	0.00	.28
0H557B	IV	ROCKET HEAT W/LCHR M72 S	15.00	.81	.05	.43	6.35
0G803A	I	ADAPTER GREN PROJ M1A1 W	48.00	.00	.00	.00	.00
0G937	II-D	GREN HD AND RIFLE SMK WP	16.00	.02	.00	.00	.05
TOTAL						1.01	46.72

BASIC ALLOWANCE OF CLASS VW FOR M8937X

DODIC	CG CLASS	DESCRIPTION		ROUNDS
0A475	I	CTG CAL .45 BALL M1911		924.
0A400	I	CTG CAL .38 SPECIAL BALL M41		430.
0A068A	I	CTG 5.56MM TRACER M196	F/OTHER FO	1540.
0A071A	I	CTG 5.56MM BALL M193 10-RD	F/OTHER FO	43120.
0G841	I	CTG RIFLE GRENADE 5.56MM M195		308.
0H557B	IV	ROCKET HEAT W/LCHR M72 SERIES M72 SERIS		12.
0G803A	I	ADAPTER GREN PROJ M1A1 W/LAUNCHING CLIPS		7.
0G937	II-D	GREN HC AND RIFLE SMK WP M34		32.

REPLENISHMENT RATE (PER DAY) OF CLASS VA FOR M8937X

REPLENISHMENT RATE (PER DAY) OF CLASS VA FOR M8937X

DODIC	CG CLASS	DESCRIPTION	ITEMS PER PACKAGE ITEMS	ITEMS	PACKAGES	CU FT	POUNDS
AVORDCUCH46F	SPEC	AVIATION ORDNANCE CUBE F	1.00	20.16	20.16	20.16	0.00
AVORDWTCH46F	SPEC	AVIATION ORDNANCE WEIGHT	1.00	1224.00	1224.00	0.00	1224.00
TOTAL						20.16	1224.00

MOUNT OUT (REPLENISHMENT) OF MAJOR EQUIPMENT FOR M8937X

SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	*******MOUNT OUT REQUIREMENT******* QUANTITY	SQ FT	CU FT	POUNDS	ORGN LOAD QUANTITY	LANFOR SUPPLIES QUANTITY
CLASS VII* (TYPE 1)									
	B0630	00903K	FLOODLIGHT SET,	0.	0.	0.	0.	0.	0.
	D0840	04459B	TRAILER, AMPHIB	0.	0.	0.	0.	0.	0.
	D1160	04751A	TRUCK, UTILITY,	0.	0.	0.	0.	0.	0.
CLASS VII* (TYPE 3)									
TOTAL CLASS VII*					0.	0.	0.		
ORGN LOAD					0.	0.	0.		
LANFOR SUPPLIES					0.	0.	0.		

MCUNT OUT (REPLENISHMENT) OF MAJOR EQUIPMENT FOR M8937X

NON-SQUARE LOADED EQUIPMENT

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	*******MOUNT OUT REQUIREMENT******* QUANTITY	SQ FT	CU FT	POUNDS	ORGN. LOAD QUANTITY	LANFOR SUPPLIES QUANTITY
CLASS VIIW (TYPE 1+2)									
	A2480	00276A	SWITCHBOARD, TE	0.		0.	0.	0.	0.
CLASS VIIW (TYPE 3)									
TOTAL CLASS VIIW						0.	0.		
CRGN LOAD						0.	0.		
LANFUR SUPPLIES						0.	0.		

ASSAULT ECHELON REPLENISHMENT CARGO

(CLASSES I, II, IV, VI, VII NON-SQUARE, VIII AND IX)

CARRIED BY FOLLOW ON ECHELON FOR M8937X

CATEGORY	DOS	CU FT	POUNDS	SQ FT
CLASS I (A RATIONS)	0	0.	0.	
CLASS I (B RATIONS)	0	0.	0.	
CLASS I (MCI)	45	2142.	70492.	
CLASS I (TRIOXANE)	45	28.	542.	
TOTAL CLASS I		2170.	71035.	
CLASS IIW	45	50.	815.	
CLASS IV	45	0.	0.	
CLASS VI (RAT SUPP)	45	205.	5206.	
CLASS VI (OTHER)	45	0.	0.	
CLASS VIIW (NON-SQUARE)	45	0.	0.	
CLASS VIII	45	64.	1069.	
CLASS IXW (UNIT)	45	27.	977.	
CLASS IXW (SUPPORTING)	45	22.	1312.	
CLASS X	45	0.	0.	
TOTAL		2538.	80413.	
CLASS VIIW (SQUARE)	45	0.	0.	0.

ASSAULT ECHELON CLASS III CARRIED BY THE FOLLOW ON ECHELON FOR M8937X

CATEGORY	DOS	55 GAL DRUMS DRUMS	55 GAL DRUMS GALLONS	55 GAL DRUMS CU FT	55 GAL DRUMS POUNDS	BULK GALLONS	BULK CU FT	BULK POUNDS	DRY PACKAGES CU FT	DRY PACKAGES POUNDS
DIESEL	45	0.	0.	0.	0.	11946.	1601.	83502.		
MOGAS	45	0.	0.	0.	0.	6978.	935.	42638.		
JP	45	0.	0.	0.	0.	295439.	39589.	2008988.		
KEROSENE	45	0.	0.	0.	0.	89.	12.	605.		
LUBE (IIIW)	45	15.	810.	165.	6966.				0.	0.
LUBE (IIIA)	45	3.	162.	33.	1406.					
CLASS IIIW (MARCORP)	45	0.	0.	0.	0.				31.	946.
TOTAL		18.	972.	198.	8372.	314452.	42137.	2135732.	31.	946.

ASSAULT ECHELON CLASS VW CARRIED BY THE FOLLOW ON ECHELON FOR M8937X

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
I	0A475	CTG CAL .45 BALL M1911	2000.	904.	0.	0.	51.
I	0A068A	CTG 5.56MM TRACER M196	1640.	4420.	3.	3.	162.
I	0A071A	CTG 5.56MM BALL M193 10-RD	1680.	43120.	26.	31.	2053.
I	TOTAL					33.	2266.
IV	0H557B	ROCKET HEAT W/LCHR M72 SERIES	15.	30.	2.	16.	240.
IV	TOTAL					16.	240.
TOTAL						49.	2506.

AD-A041 598 STANFORD RESEARCH INST MENLO PARK CALIF NAVAL WARFAR--ETC F/G 15/5
MATERIEL WEIGHT AND CUBE CONTROL (1975-1980).(U)
MAR 76 T H ALLEN, R B RINGO N00014-75-C-0708
UNCLASSIFIED NL

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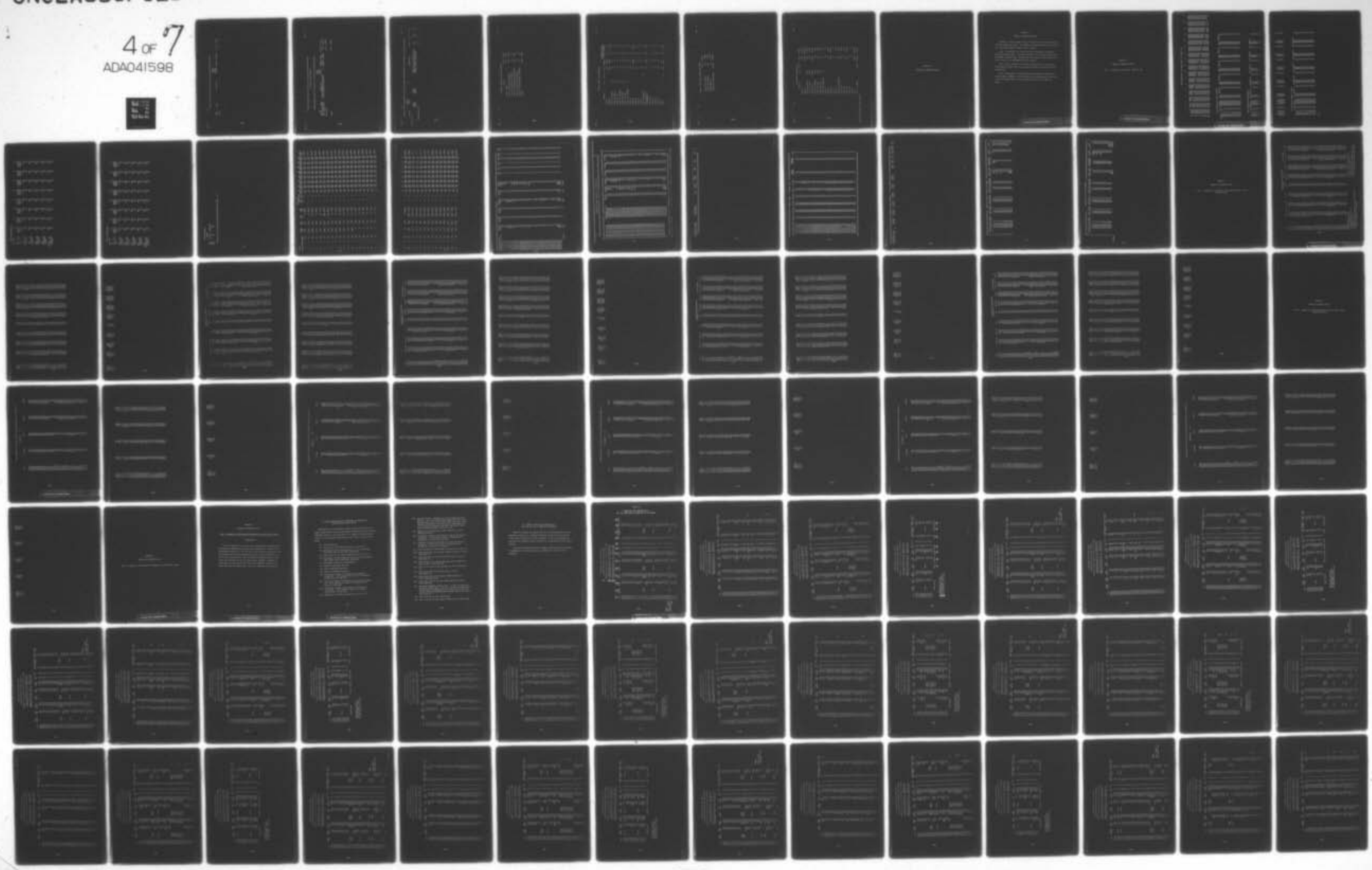

ASSAULT ECHELON CLASS VZ CARRIED BY THE FOLLOW ON ECHELON FOR M8937X

CG CLASS	DODIC	DESCRIPTION	ROUNDS PER PACKAGE ROUNDS	ROUNDS	PACKAGES	CU FT	POUNDS
TOTAL						0.	0.

ASSAULT ECHELON CLASS VA CARRIED BY THE FOLLOW ON ECHELON FOR M8937X

ASSAULT ECHELON SORTIES

ASSAULT ECHELON CLASS VA CARRIED BY THE FOLLOW ON ECHELON FOR M8937X

CG CLASS	DODIC	DESCRIPTION	ITEMS PER PACKAGE ITEMS	ITEMS	PACKAGES	CU FT	POUNDS
SPEC	AVORDCUCH46F	AVIATION ORDNANCE CUBE FOR CH4	1.	2117.	2117.	2117.	0.
SPEC	AVORDWTCH46F	AVIATION ORDNANCE WEIGHT FOR C	1.	128520.	128520.	0.	128520.
SPEC TOTAL						2117.	128520.
TOTAL						2117.	128520.

ASSAULT ECHELON REPLENISHMENT CLASS VII(SQUARE LOADED) CARRIED BY THE FOLLOW ON ECHELON FOR MB937X

CATEGORY	CONTROL NUMBER OR FSN	ID	DESCRIPTION	SQ FT	CU FT	POUNDS
CLASS VII*						
	B0630	00903K	FLOODLIGHT SET, ELECTRIC, FSSE	0.	0.	0.
	D0840	04469B	TRAILER, AMPHIB CARGO, 1/4T, 2	0.	0.	0.
	D1160	04751A	TRUCK, UTILITY, 1/4T M151A1-	0.	0.	0.
TOTAL CLASS VII*				0.	0.	0.

PERSONNEL INDIVIDUAL LOADS FOR M8937X

CATEGORY	CU FT	POUNDS
CLASS I (MCI)	48.	1566.
CLASS II (INDIVIDUAL WEAPONS)	87.	1573.
CLASS II (CREW SERVED WEAPONS)	0.	0.
CLASS II (ORGANIZATIONAL EQUIPMENT)	392.	5396.
CLASS VII (CREW SERVED WEAPONS)	0.	0.
CLASS VII (ORGANIZATIONAL EQUIPMENT)	0.	0.
TOTAL	526.	8536.

MOBILE LOADED CARGO FOR M8937X

CATEGORY	GAL	SQ FT	CU FT	POUNDS	****UTILIZED***** ****CAPACITY***** CU FT	POUNDS
CLASS I			48.	1566.	0.	0.
CLASS II			520.	7485.	52.	790.
CLASS III DIESEL	0.		0.	0.	0.	0.
CLASS III MOGAS	0.		0.	0.	0.	0.
CLASS III JP	0.		0.	0.	0.	0.
CLASS III KEROSENE	0.		0.	0.	0.	0.
CLASS IIIW LUBE	0.		0.	0.	0.	0.
CLASS IIIA LUBE	0.		0.	0.	0.	0.
CLASS IIIW (MARCORP)	0.		0.	0.	0.	0.
CLASS IV			0.	0.	0.	0.
CLASS VW			37.	2000.	0.	2000.
CLASS VA			0.	0.	0.	0.
CLASS VZ			0.	0.	0.	0.
CLASS VI			0.	0.	0.	0.
CLASS VII NML(SQ)		0.	0.	0.	0.	0.
OTHER CLASS VII (NON-SQUARE)			8.	210.	10.	210.
CLASS VIII			0.	0.	0.	0.
CLASS IXW			0.	0.	0.	0.
CLASS IXA			0.	0.	0.	0.
CLASS IXZ			0.	0.	0.	0.
CLASS X			0.	0.	0.	0.
TOTAL		0.	613.	11261.	62.	3000.

MOBILE LOADED CARGO SUMMARY FOR M8937X

	CU FT	POUNDS
MOBILE LOAD CAPACITY	62.	10000.
MOBILE LOADED CARGO	613.	11261.
UNUSED CAPACITY	0.	7000.
NON-MOBILE LOADED CARGO	252723.	2342566.

GENERAL CARGO FOR M8937X

CATEGORY	GAL	SQ FT	CU FT	POUNDS
CLASS I			676.	22112.
CLASS II			41915.	1081091.
CLASS III DIESEL	4033.		685.	30187.
CLASS III MOGAS	2346.		396.	15466.
CLASS III JP	98480.		14163.	683451.
CLASS III KEROSENE	106.		22.	829.
CLASS IIIW LUBE	324.		66.	2786.
CLASS IIIA LUBE	108.		22.	937.
CLASS IIIW (MARCORP)	0.		10.	315.
CLASS IV			0.	0.
CLASS VW			32.	1872.
CLASS VA			1512.	91800.
CLASS VZ			0.	0.
CLASS VI			68.	1735.
CLASS VII NON-SQUARE			217.	3081.
CLASS VIII			145.	2537.
CLASS IXW			16.	763.
CLASS IXA			2969.	43753.
CLASS IXZ			0.	0.
CLASS X			0.	0.
TOTAL			62914.	1982716.
CLASS VII SQUARE		14411.	189809.	359850.

READ AN INPUT CARD. CARD IS...STOP

Appendix C

SAMPLES OF COMPUTER OUTPUTS

Appendix C

SAMPLES OF COMPUTER OUTPUTS

Appendix C contains sample output listings for the principal computer programs used in the study. The appendix is divided into four parts--each part presenting different sample output listings.

Parts 1 illustrates the output from the Transporation Feasibility Estimator Program (TFE). The output represents the results obtained from processing a notional MAU. Descriptions for reading the TFE Program output are found in the HQ FMFPAC TFE User's Manual.

Parts 2 and 3 illustrate the output listings from the Constrained Cargo Factoring Model (CFF) for factored cargo and constrained cube runs, respectively.

Part 4 illustrates the output from the Constrained T/E Embarkation Analysis Model (CONTEAM). The listings from ten representative FMF units, each constrained to 90, 85, and 75 percent of full T/E strength are shown.

Appendix C

SAMPLES OF COMPUTER OUTPUT

Part 1: Example of TFE Output: Notional MAU

DISTANCE MATRIX AIR UPPER RIGHT SEA LOWER LEFT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
2	4800.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
3	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
4	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
5	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
6	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
7	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
8	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
9	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.	99999.
10	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.	99999.
11	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.	99999.
12	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.	99999.
13	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.	99999.
14	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.	99999.
15	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.	99999.
16	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	99999.	0.

POD CONSTRAINTS (MEAS. TONS/DAY)

	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY
POD- 1	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 2	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 3	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 4	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 5	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 6	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 7	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 8	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 9	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-10	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-11	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-12	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-13	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-14	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-15	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-16	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.

POD CONSTRAINTS(MISCCRGO/DAY)

	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY
POD- 1	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 2	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 3	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 4	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 5	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 6	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 7	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
[illegible]	0.	[illegible]	[illegible]	0.	[illegible]	0.	999.	0.	999.	0.	999.	0.

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
POD-11	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-12	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-13	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-14	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-15	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-16	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.

POD CONSTRAINTS(SQUARE FT/DAY)

	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY	DAY	CAPACITY
POD- 1	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 2	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 3	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 4	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 5	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 6	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 7	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 8	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD- 9	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-10	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-11	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-12	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-13	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-14	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-15	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.
POD-16	0.	999999.	999.	0.	999.	0.	999.	0.	999.	0.	999.	0.

AIR NODE CONSTRAINTS

AIR NODE	1	2	3	4	5	6	7	8
DAY	0.	0.	0.	0.	0.	0.	0.	0.
MEAS. TONS	999999.	999999.	999999.	999999.	999999.	999999.	999999.	999999.
PASSENGERS	999999.	999999.	999999.	999999.	999999.	999999.	999999.	999999.
SORTIES	999999.	999999.	999999.	999999.	999999.	999999.	999999.	999999.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.

AIR NODE CONSTRAINTS

AIR NODE	9	10	11	12	13	14	15	16
DAY	0.	0.	0.	0.	0.	0.	0.	0.
MEAS. TONS	999999.	999999.	999999.	999999.	999999.	999999.	999999.	999999.
PASSENGERS	999999.	999999.	999999.	999999.	999999.	999999.	999999.	999999.
SORTIES	999999.	999999.	999999.	999999.	999999.	999999.	999999.	999999.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.
DAY	999.	999.	999.	999.	999.	999.	999.	999.
MEAS. TONS	0.	0.	0.	0.	0.	0.	0.	0.
PASSENGERS	0.	0.	0.	0.	0.	0.	0.	0.
SORTIES	0.	0.	0.	0.	0.	0.	0.	0.

ATTRITION RATES

SINGLE

DAY	RATE TO	RATE FROM
999.	0.	0.
999.	0.	0.
999.	0.	0.

NUMBER OF DAYS FOR PROBLEM RUN**************************= 19.

SHIP INPUT

SHIP GROUP	NUMBER	SPEED	CARGO CAP	PAX CAP	MIS CAP	AREA CAP	DAYS TO LOAD	DAYS TO UNLD	DAY AVAIL POE-1	DAY AVAIL POE-2	DAY AVAIL POE-3	DAY AVAIL POE-4	DAY AVAIL POE-5	DAY AVAIL POE-6	DAY AVAIL POE-7	DAY AVAIL POE-8	SHIP USAGE
1	1	20.	2526.	226.	-0.	32269.	1	5	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
2	1	20.	2522.	226.	-0.	32904.	1	5	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
3	1	20.	2522.	226.	-0.	33046.	1	5	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
4	1	20.	1074.	322.	-0.	17903.	1	5	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
5	1	20.	490.	1374.	-0.	7741.	1	2	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
6	1	20.	3042.	1903.	563.	21000.	1	3	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
7	1	20.	3042.	1903.	563.	21000.	1	3	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
8	1	20.	1251.	947.	-0.	9375.	1	2	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
9	1	20.	1261.	927.	-0.	9975.	1	2	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
10	1	20.	950.	858.	-0.	10275.	1	2	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
11	1	20.	1130.	861.	-0.	9300.	1	2	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
12	1	20.	994.	875.	-0.	8250.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
13	1	20.	1152.	859.	-0.	9900.	1	2	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
14	1	20.	0.	333.	-0.	3341.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
15	1	20.	0.	323.	-0.	3341.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
16	1	20.	0.	316.	99.	3341.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
17	1	20.	0.	314.	-0.	3341.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
18	1	20.	0.	337.	-0.	3341.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE
19	1	20.	0.	337.	-0.	3341.	1	1	1 999	999 999	999 999	999 999	999 999	999 999	999 999	999 999	SINGLE

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
									999	999	999	999	999	999	999	999	
21	1	20.	0.	337.	-0.	23401.	1	1	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
22	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
23	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
24	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
25	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
26	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
27	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
28	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
29	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
30	1	20.	107.	386.	8738.	15720.	1	2	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
31	1	20.	107.	386.	8738.	15720.	1	1	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
32	1	20.	1147.	1771.	6333.	3574.	1	1	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
33	1	20.	1037.	1764.	6333.	3253.	1	1	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	
34	1	20.	1018.	1815.	6333.	4414.	1	1	1	999	999	999	999	999	999	999	SINGLE
									999	999	999	999	999	999	999	999	

*** PRIORITY 1 ***

REQUIREMENT NAME	BLKCRGO	OUTSIZE	NON-AIR	PSSNGRS	-MISC-	SQFEET	POE	POD	OAD	FAE	MODE	RDC
CCVAAM0100UA	55.	0.	0.	75.	2.	1355.	1	2	1	10	4	14
PGLAAM0101UA	9.	0.	0.	11.	1.	321.	1	2	1	10	4	14
M0102M0102UA	5.	0.	0.	8.	0.	214.	1	2	1	10	4	14
PCHECM0110UA	35.	0.	0.	46.	1.	680.	1	2	1	10	4	14
03VAAM1013 A	182.	0.	0.	207.	1.	0.	1	2	1	10	4	14
03VAAM1013 B	182.	0.	0.	207.	1.	0.	1	2	1	10	4	14
03VAAM1013 C	182.	0.	0.	207.	1.	0.	1	2	1	10	4	14
03VAAM1013 D	182.	0.	0.	207.	1.	0.	1	2	1	10	4	14
9GJAAM1037 A	570.	0.	0.	402.	9.	4780.	1	2	1	10	4	14
M0200M0200UA	1.	0.	0.	4.	0.	0.	1	2	1	10	4	14
1HMAAM1103 A	559.	0.	0.	126.	5.	4842.	1	2	1	10	4	14
9HLEBM0201UA	9.	0.	0.	22.	0.	177.	1	2	1	10	4	14
4HXAAM0203UA	21.	0.	0.	43.	1.	263.	1	2	1	10	4	14
4HVECM0202UA	1.	0.	0.	8.	0.	0.	1	2	1	10	4	14
PHSAAM0204UA	11.	0.	0.	24.	0.	214.	1	2	1	10	4	14
M0205M0205UA	1.	0.	0.	3.	0.	0.	1	2	1	10	4	14
FJQEBM0206UA	11.	0.	0.	9.	0.	280.	1	2	1	10	4	14
2SSAAM0207UA	174.	0.	0.	22.	3.	1847.	1	2	1	10	4	14
9SNECM0208UA	1.	0.	0.	5.	0.	0.	1	2	1	10	4	14
2TYABM0209UA	52.	0.	0.	35.	8.	3297.	1	2	1	10	4	14
9TWEBM0210UA	1.	0.	0.	7.	0.	0.	1	2	1	10	4	14
M0300M0300UA	340.	0.	0.	13.	14.	10485.	1	2	1	10	4	14
9CXAAM0301UA	1.	0.	0.	3.	0.	0.	1	2	1	10	4	14
M0302M0302UA	1.	0.	0.	7.	0.	0.	1	2	1	10	4	14
QGDECM0303UA	1.	0.	0.	7.	0.	0.	1	2	1	10	4	14
PHSAAM0204UA	1.	0.	0.	2.	0.	0.	1	2	1	10	4	14
UJVAAM0305UA	12.	0.	0.	35.	0.	0.	1	2	1	10	4	14
2SSAAM0207UA	1.	0.	0.	8.	0.	0.	1	2	1	10	4	14
FJBEBM0307UA	1.	0.	0.	3.	0.	0.	1	2	1	10	4	14
FTFEBM0308UA	1.	0.	0.	3.	0.	0.	1	2	1	10	4	14
9JLAAM0309UA	8.	0.	0.	29.	0.	0.	1	2	1	10	4	14
9JJECM0310UA	9.	0.	0.	31.	0.	0.	1	2	1	10	4	14
JJEEHM0311UA	33.	0.	0.	36.	0.	0.	1	2	1	10	4	14
HJFEBM0312UA	3.	0.	0.	12.	0.	0.	1	2	1	10	4	14
UJCEBM0313UA	1.	0.	0.	6.	0.	0.	1	2	1	10	4	14
HVRL1M0314UA	1.	0.	0.	9.	0.	0.	1	2	1	10	4	14
HVRL2M0315UA	1.	0.	0.	4.	0.	0.	1	2	1	10	4	14
HVRL3M0316UA	1.	0.	0.	4.	0.	0.	1	2	1	10	4	14
JVJE1M0317UA	1.	0.	0.	2.	0.	0.	1	2	1	10	4	14
JVJE2M0318UA	4.	0.	0.	20.	0.	0.	1	2	1	10	4	14
JVJE3M0319UA	1.	0.	0.	2.	0.	0.	1	2	1	10	4	14
JVJE4M0320UA	1.	0.	0.	4.	0.	0.	1	2	1	10	4	14
9VCECM0321UA	2.	0.	0.	9.	0.	0.	1	2	1	10	4	14
M0600M0600UA	630.	0.	0.	372.	92.	9404.	1	2	1	10	4	14
M0200M0200UA	2177.	0.	0.	402.	139.	5349.	1	2	1	10	4	14
M0701M0701UA	872.	0.	0.	142.	0.	40913.	1	2	1	10	4	14
TOTAL =	6348.	0.	0.	2843.	279.	84421.						

THERE WAS NO CHANGE FROM DAY- 0 THRU DAY- 11

DAY- 12

ADDITIONAL CARGO DELIVERED BY THE END OF DAY- 13

POSSIBLE CLOSURE	REQUIREMENT NAME	MISCRGO	SQUAREFT	BLKCRGO	OUTSIZE	NON-AIR	PSSNGRS
THIS UNIT CLOSED	CCVAAM0100UA	2.0	1355.0	55.0	0.0	0.0	75.
THIS UNIT CLOSED	PGLAAM0101UA	1.0	321.0	9.0	0.0	0.0	11.
THIS UNIT CLOSED	M0102M0102UA	0.0	214.0	5.0	0.0	0.0	8.
THIS UNIT CLOSED	PUBECM0110BA	1.0	680.0	35.0	0.0	0.0	46.
THIS UNIT CLOSED	OGVAAM1013 A	1.0	0.0	182.0	0.0	0.0	207.
THIS UNIT CLOSED	OGVAAM1013 B	1.0	0.0	182.0	0.0	0.0	207.
THIS UNIT CLOSED	OGVAAM1013 C	1.0	0.0	182.0	0.0	0.0	207.
THIS UNIT CLOSED	OGVAAM1013 D	1.0	0.0	182.0	0.0	0.0	207.
THIS UNIT CLOSED	9GUAAM1037 A	9.0	4780.0	570.0	0.0	0.0	402.
THIS UNIT CLOSED	M0200M0200UA	0.0	0.0	1.0	0.0	0.0	4.
THIS UNIT CLOSED	1HMAAM1103 A	5.0	4845.0	559.0	0.0	0.0	126.
THIS UNIT CLOSED	9HLEBM0201UA	0.0	177.0	9.0	0.0	0.0	22.
THIS UNIT CLOSED	4HXAAM0203UA	1.0	263.0	21.0	0.0	0.0	43.
THIS UNIT CLOSED	4HVECM0202UA	0.0	0.0	1.0	0.0	0.0	8.
THIS UNIT CLOSED	PHSAAM0204UA	0.0	214.0	11.0	0.0	0.0	24.
THIS UNIT CLOSED	M0205M0205UA	0.0	0.0	1.0	0.0	0.0	3.
THIS UNIT CLOSED	FJGEHM0206UA	0.0	280.0	11.0	0.0	0.0	9.
THIS UNIT CLOSED	2SSAAM0207UA	3.0	1847.0	174.0	0.0	0.0	22.
THIS UNIT CLOSED	9SNECM0208UA	0.0	0.0	1.0	0.0	0.0	5.
THIS UNIT CLOSED	2TYAHM0209UA	8.0	3297.0	52.0	0.0	0.0	35.
THIS UNIT CLOSED	9TWEBM0210UA	0.0	0.0	1.0	0.0	0.0	7.
THIS UNIT CLOSED	M0300M0300UA	14.0	10485.0	340.0	0.0	0.0	13.
THIS UNIT CLOSED	9CXAAM0301UA	0.0	0.0	1.0	0.0	0.0	3.
THIS UNIT CLOSED	M0302M0302UA	0.0	0.0	1.0	0.0	0.0	7.
THIS UNIT CLOSED	QGDECM0303UA	0.0	0.0	1.0	0.0	0.0	7.
THIS UNIT CLOSED	PHSAAM0204UA	0.0	0.0	1.0	0.0	0.0	2.
THIS UNIT CLOSED	UJVAAM0305UA	0.0	0.0	12.0	0.0	0.0	35.
THIS UNIT CLOSED	2SSAAM0207UA	0.0	0.0	1.0	0.0	0.0	8.
THIS UNIT CLOSED	FJBEHM0307UA	0.0	0.0	1.0	0.0	0.0	3.
THIS UNIT CLOSED	FTFEBM0308UA	0.0	0.0	1.0	0.0	0.0	3.
THIS UNIT CLOSED	9JLAAM0309UA	0.0	0.0	8.0	0.0	0.0	29.
THIS UNIT CLOSED	9JJECM0310UA	0.0	0.0	9.0	0.0	0.0	31.
THIS UNIT CLOSED	JJEEHM0311UA	0.0	0.0	33.0	0.0	0.0	36.
THIS UNIT CLOSED	HJFEHM0312UA	0.0	0.0	3.0	0.0	0.0	12.
THIS UNIT CLOSED	UJCEBM0313UA	0.0	0.0	1.0	0.0	0.0	6.
THIS UNIT CLOSED	HVRL1M0314UA	0.0	0.0	1.0	0.0	0.0	9.
THIS UNIT CLOSED	HVRL2M0315UA	0.0	0.0	1.0	0.0	0.0	4.
THIS UNIT CLOSED	HVRL3M0316UA	0.0	0.0	1.0	0.0	0.0	4.
THIS UNIT CLOSED	JVJE1M0317UA	0.0	0.0	1.0	0.0	0.0	2.
THIS UNIT CLOSED	JVJE2M0318UA	0.0	0.0	4.0	0.0	0.0	20.
THIS UNIT CLOSED	JVJE3M0319UA	0.0	0.0	1.0	0.0	0.0	2.
THIS UNIT CLOSED	JVJE4M0320UA	0.0	0.0	1.0	0.0	0.0	4.
THIS UNIT CLOSED	9VCECM0321UA	0.0	0.0	2.0	0.0	0.0	9.
THIS UNIT CLOSED	M0600M0600UA	92.0	9404.0	630.0	0.0	0.0	372.
	M0200M0200UA	139.0	5347.0	1002.0	0.0	0.0	402.
	M0701M0701UA	0.0	38491.7	0.0	0.0	0.0	142.

ADDITIONAL CARGO DELIVERED BY THE END OF DAY- 14

[illegible]	[illegible] NAME	[illegible]	[illegible]	[illegible]	OUTSIZE	NON-AIR	[illegible]
THIS UNIT CLOSED	M0200M0200UA	0.0	0.0	1175.0	0.0	0.0	0.
THIS UNIT CLOSED	M0701M0701UA	0.0	2421.2	872.0	0.0	0.0	0.

** PRIORITY GROUP 1 CLOSURES (DAY) **

REQUIREMENT NAME	BLKCRGO	OUTSIZE	NON-AIR	PSSNGRS	-MISC-	SQ-FEET	FINAL CLOSURE	DESIRED DELIVERY	MODE
M0701M0701UA	14	999	999	13	999	14	14	14	4
CCVAAM0100UA	13	999	999	13	13	13	13	14	4
PGLAAM0101UA	13	999	999	13	13	13	13	14	4
M0102M0102UA	13	999	999	13	999	13	13	14	4
PUBECM0110BA	13	999	999	13	13	13	13	14	4
0GVAAM1013 A	13	999	999	13	13	999	13	14	4
0GVAAM1013 B	13	999	999	13	13	999	13	14	4
0GVAAM1013 C	13	999	999	13	13	999	13	14	4
0GVAAM1013 D	13	999	999	13	13	999	13	14	4
9GUAAM1037 A	13	999	999	13	13	13	13	14	4
M0200M0200UA	13	999	999	13	999	999	13	14	4
1HMAAM1103 A	13	999	999	13	13	13	13	14	4
9HLEBM0201UA	13	999	999	13	999	13	13	14	4
4HXAAM0203UA	13	999	999	13	13	13	13	14	4
4HVECM0202UA	13	999	999	13	999	999	13	14	4
PHSAAM0204UA	13	999	999	13	999	13	13	14	4
M0205M0205UA	13	999	999	13	999	999	13	14	4
FJQEBM0206UA	13	999	999	13	999	13	13	14	4
2SSAAM0207UA	13	999	999	13	13	13	13	14	4
9SNECM0208UA	13	999	999	13	999	999	13	14	4
2TYAHM0209UA	13	999	999	13	13	13	13	14	4
9TWEBM0210UA	13	999	999	13	999	999	13	14	4
M0300M0300UA	13	999	999	13	13	13	13	14	4
9CXAAM0301UA	13	999	999	13	999	999	13	14	4
M0302M0302UA	13	999	999	13	999	999	13	14	4
QGDECM0303UA	13	999	999	13	999	999	13	14	4
PHSAAM0204UA	13	999	999	13	999	999	13	14	4
UJVAAM0305UA	13	999	999	13	999	999	13	14	4
2SSAAM0207UA	13	999	999	13	999	999	13	14	4
FJREBM0307UA	13	999	999	13	999	999	13	14	4
FTFEBM0308UA	13	999	999	13	999	999	13	14	4
9JLAAM0309UA	13	999	999	13	999	999	13	14	4
9JJECM0310UA	13	999	999	13	999	999	13	14	4
JJEEBM0311UA	13	999	999	13	999	999	13	14	4
HJFEBM0312UA	13	999	999	13	999	999	13	14	4
UJCEBM0313UA	13	999	999	13	999	999	13	14	4
HVRL1M0314UA	13	999	999	13	999	999	13	14	4
HVRL2M0315UA	13	999	999	13	999	999	13	14	4
HVRL3M0316UA	13	999	999	13	999	999	13	14	4
JVJE1M0317UA	13	999	999	13	999	999	13	14	4
JVJE2M0318UA	13	999	999	13	999	999	13	14	4
JVJE3M0319UA	13	999	999	13	999	999	13	14	4
JVJE4M0320UA	13	999	999	13	999	999	13	14	4
9VCECM0321UA	13	999	999	13	999	999	13	14	4
M0600M0600UA	13	999	999	13	13	13	13	14	4
M0200M0200UA	14	999	999	13	13	13	14	14	4

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*** PRIORITY 2 ***

REQUIREMENT NAME	BLKCRGO	OUTSIZE	NON-AIR	PSSNGRS	-MISC-	SQFEET	POE	POD	OAD	FAE	MODE	RDD

SHIPS THAT SAILED PARTIALLY LOADED,

PARTIAL SHIP NUMBER	PORT LOADED	DESTINATION	UNLOADING COMPLETED	MEAS. TONS	PASSENGERS	-MISC-	AREA
NUMBER 2	POE- 1	POD- 2	DAY 13.	107.2	386.	279.0	15720.0
NUMBER 3	POE- 1	POD- 2	DAY 13.	1147.2	1582.	0.0	3574.5
NUMBER 4	POE- 1	POD- 2	DAY 13.	0.0	16.	0.0	3341.2
NUMBER 5	POE- 1	POD- 2	DAY 13.	1036.8	0.	0.0	3253.5
NUMBER 6	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	3341.2
NUMBER 7	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	3341.2
NUMBER 8	POE- 1	POD- 2	DAY 13.	1017.6	0.	0.0	4414.5
NUMBER 9	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	3341.2
NUMBER 10	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	3341.2
NUMBER 11	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	3341.2
NUMBER 12	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	3341.2
NUMBER 13	POE- 1	POD- 2	DAY 13.	0.0	0.	0.0	23400.7
NUMBER 14	POE- 1	POD- 2	DAY 14.	490.4	0.	0.0	2422.5
NUMBER 15	POE- 1	POD- 2	DAY 14.	1251.2	0.	0.0	0.0
NUMBER 16	POE- 1	POD- 2	DAY 14.	306.8	0.	0.0	0.0

UNUSED CAPACITY FOR PARSHIPS

PARTIAL SHIP NUMBER	PORT LOADED	DESTINATION	UNLOADING COMPLETED	MEAS. TONS	PASSENGERS	-MISC-	AREA
NUMBER 2	POE- 1	POD- 2	DAY 13.	0.0	0.	8459.0	0.0
NUMBER 3	POE- 1	POD- 2	DAY 13.	0.0	189.	6333.0	0.0
NUMBER 4	POE- 1	POD- 2	DAY 13.	0.0	317.	0.0	0.0
NUMBER 5	POE- 1	POD- 2	DAY 13.	0.0	1764.	6333.0	0.0
NUMBER 6	POE- 1	POD- 2	DAY 13.	0.0	323.	0.0	0.0
NUMBER 7	POE- 1	POD- 2	DAY 13.	0.0	316.	99.0	0.0
NUMBER 8	POE- 1	POD- 2	DAY 13.	0.0	1815.	6333.0	0.0
NUMBER 9	POE- 1	POD- 2	DAY 13.	0.0	314.	0.0	0.0
NUMBER 10	POE- 1	POD- 2	DAY 13.	0.0	337.	0.0	0.0
NUMBER 11	POE- 1	POD- 2	DAY 13.	0.0	337.	0.0	0.0
NUMBER 12	POE- 1	POD- 2	DAY 13.	0.0	337.	0.0	0.0
NUMBER 13	POE- 1	POD- 2	DAY 13.	0.0	337.	0.0	0.0
NUMBER 14	POE- 1	POD- 2	DAY 14.	0.0	1374.	0.0	5319.0
NUMBER 15	POE- 1	POD- 2	DAY 14.	0.0	947.	0.0	9375.0
NUMBER 16	POE- 1	POD- 2	DAY 14.	954.0	927.	0.0	9975.0
				954.0			24669.0

FINISHED

Appendix C

SAMPLES OF COMPUTER OUTPUT

Part 2: Example of Constrained Cargo Factoring Model Output: Factored Cargo

FACTORED CARGO CATEGORIES

CONSTRAINT .90 DOS ADJUSTMENT 0

UNIT	BULK TOT 1	CON T/E 2	MO 3	OMA 4	CON BULK 5	SQ T/F 6	CON SQ T/F 7	CON SQ 8
[illegible]	1757.7	1613.4	59.5	0.0	1672.0	328.4	312.0	314.0
M1036	195.0	92.9	83.0	0.0	175.0	4662.9	4196.6	4233.0
M1075	185.0	92.9	83.0	0.0	175.0	4662.9	4196.6	4233.0
M1095	186.0	92.9	83.0	0.0	175.0	4662.9	4196.6	4233.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1128	1678.5	348.3	1312.3	0.0	1660.0	23015.7	21864.9	22048.0
M1128	1678.5	348.3	1312.3	0.0	1660.0	23015.7	21864.9	22048.0
M4233	905.7	532.1	345.8	0.0	877.0	6531.0	6204.4	6256.0
M4233	905.7	532.1	345.8	0.0	877.0	6531.0	6204.4	6256.0
M4233	905.7	532.1	345.8	0.0	877.0	6531.0	6204.4	6256.0
M1423	437.3	398.8	17.5	0.0	416.0	69.4	66.0	65.0
M1423	437.3	398.8	17.5	0.0	416.0	69.4	66.0	66.0
M1423	437.3	398.8	17.5	0.0	416.0	69.4	66.0	66.0
M1373X	70.9	24.7	43.4	0.0	68.0	1096.3	986.6	995.0
M1373X	70.9	24.7	43.4	0.0	68.0	1096.3	986.6	995.0
M1373X	70.9	24.7	43.4	0.0	68.0	1096.3	986.6	995.0
M1373X	70.9	24.7	43.4	0.0	68.0	1096.3	986.6	995.0
M4652	110.3	39.2	69.1	0.0	108.0	15292.2	14527.6	14649.0
M4652	110.3	39.2	69.1	0.0	108.0	15292.2	14527.6	14649.0
M4652	110.3	39.2	69.1	0.0	108.0	15292.2	14527.6	14649.0
M1863X	99.5	65.8	27.4	0.0	93.0	1961.4	1765.2	1780.0
M1864X	345.1	116.7	215.5	0.0	332.0	12631.4	11368.3	11463.0
M1862X	135.7	50.6	79.6	0.0	130.0	23312.4	20981.1	21166.0
M1038	1014.4	559.1	426.6	0.0	985.0	4426.8	4205.4	4240.0
M1128	1678.5	348.3	1312.3	0.0	1660.0	23015.7	21864.9	22048.0
M1196	969.0	546.6	361.8	0.0	908.0	17363.7	15627.4	15765.0
M1363X	2313.5	1062.7	1139.9	0.0	2202.0	31214.4	28093.0	28341.0
M4237	847.1	628.2	149.4	0.0	777.0	16832.0	15148.8	15282.0
M4233	905.7	532.1	345.8	0.0	877.0	6531.0	6204.4	6256.0
M4652	110.3	39.2	69.1	0.0	108.0	15292.2	14527.6	14649.0
M4903	35.0	18.0	13.9	0.0	31.0	605.2	514.4	519.0
M4903	35.0	18.0	13.9	0.0	31.0	605.2	514.4	519.0
M4903	35.0	18.0	13.9	0.0	31.0	605.2	514.4	519.0
M4907	95.6	41.4	47.0	0.0	88.0	6295.9	5351.5	5401.0
M3857X	398.1	201.9	173.9	0.0	375.0	10956.8	9861.1	9948.0
M3853X	58.6	33.5	21.4	0.0	54.0	1900.9	1710.8	1725.0
M3853X	58.6	33.5	21.4	0.0	54.0	1900.9	1710.8	1725.0
M3853X	58.6	33.5	21.4	0.0	54.0	1900.9	1710.8	1725.0
M3853X	58.6	33.5	21.4	0.0	54.0	1900.9	1710.8	1725.0

1 Total Bulk (in MT)
2 Constrained T/E (in MT)
3 Mountout (in MT)
4 Organizational Maintenance Activity (OMA) for Classes IIA and VIIA non square
5 Total Constrained Bulk Cargo
6 Square Loaded T/E Items
7 Constrained Square Loaded T/E Items
8 Total Constrained Square Loaded Items

M1423	437.3	398.8	17.5	0.0	416.0	69.4	66.0	66.0
M1427	115.2	69.1	38.6	0.0	107.0	6470.5	5823.4	5874.0
M8625X	172.2	106.7	53.8	0.0	160.0	3640.0	3276.0	3304.0
M1658	847.3	546.2	241.7	0.0	787.0	10485.5	9437.0	9520.0
M1377X	113.4	80.7	28.8	0.0	109.0	787.7	709.0	715.0
M1367X	153.7	50.7	102.5	0.0	153.0	6561.7	5906.6	5957.0
M1654	220.2	115.2	105.1	0.0	220.0	11536.1	10959.3	11051.0
C40 SP	1932.1	1126.3	682.7	0.0	1808.0	85992.3	77393.0	78077.0
M1612X	386.2	143.0	218.2	0.0	361.0	16526.4	14047.4	14179.0
M1531X	1005.4	259.3	717.4	0.0	976.0	13757.5	12381.7	12491.0
M8640X	321.6	126.1	173.4	0.0	299.0	7934.8	6744.6	6807.0
M8615X	196.1	113.9	62.2	0.0	176.0	2670.1	2439.6	2462.0
M8937X	1216.8	949.5	212.3	4.0	1165.0	3163.8	1907.4	1932.0
M8937X	1216.8	949.5	212.3	4.0	1165.0	3163.8	1907.4	1932.0
M8937X	1216.8	949.5	212.3	4.0	1165.0	3163.8	1907.4	1932.0
M8937X	1216.8	949.5	212.3	4.0	1165.0	3163.8	1907.4	1932.0
M8937X	1216.8	949.5	212.3	4.0	1165.0	3163.8	1907.4	1932.0
M8943X	1290.6	924.8	272.8	34.8	1232.0	3896.0	2461.4	2492.0
M8943X	1290.6	924.8	272.8	34.8	1232.0	3896.0	2461.4	2492.0
M8943X	1290.6	924.8	272.8	34.8	1232.0	3896.0	2461.4	2492.0
M8970X	1149.6	951.7	146.5	1.2	1099.0	2669.7	1484.6	1505.0
M8964X	1108.6	922.4	136.0	1.5	1059.0	2767.0	1955.1	1977.0
M8964X	1108.6	922.4	136.0	1.5	1059.0	2767.0	1955.1	1977.0
M8954X	1305.2	986.3	260.1	5.5	1251.0	3848.4	2592.9	2623.0
M8859X	2000.6	952.6	996.1	1.5	1950.0	5420.8	2007.2	2050.0
M3851X	631.5	95.4	27.5	0.0	122.0	10956.8	9313.2	9400.0
M1965X	62.0	25.6	31.9	0.0	57.0	12516.3	10638.9	10738.0
M4112	663.6	149.4	497.8	0.0	647.0	14468.8	13021.9	13137.0
M4193	416.7	107.6	297.3	0.0	404.0	10497.4	9447.7	9531.0
M8621X	114.9	37.7	73.1	0.0	110.0	4830.5	4347.5	4385.0
M4193	416.7	107.6	297.3	0.0	404.0	10497.4	9447.7	9531.0
M4201	66.6	35.8	27.1	0.0	62.0	2018.9	1817.0	1833.0
M4225	677.2	539.3	78.2	0.0	617.0	8661.0	7794.9	7863.0
M3223X	571.1	383.1	120.6	0.0	503.0	11275.2	9583.9	9673.0
M3243X	814.2	161.0	624.9	0.0	785.0	7131.2	6061.5	6118.0
M3253X	209.6	103.5	87.9	0.0	191.0	2741.2	2330.0	2351.0
M3751X	2219.9	1749.3	162.4	0.0	1911.0	7846.5	6669.5	6732.0
M3753X	801.1	106.6	675.9	0.0	782.0	8884.3	7551.6	7622.0
M3753X	801.1	106.6	675.9	0.0	782.0	8884.3	7551.6	7622.0

M8914X	179.6	98.1	64.3	.0	162.0	4800.8	2176.7	2214.0
M8914X	179.6	98.1	64.3	.0	162.0	4800.8	2176.7	2214.0
M8921	3238.2	2540.8	254.6	0.0	2795.0	17236.7	14651.2	14788.0
M8921	3238.2	2540.8	254.6	0.0	2795.0	17236.7	14651.2	14788.0
M8821	87.0	45.3	33.8	0.0	79.0	2180.6	1853.5	1870.0
M8821	87.0	45.3	33.8	0.0	79.0	2180.6	1853.5	1870.0

FACTORED CARGO CATEGORIES
CONSTRAINT .88 DOS ADJUSTMENT 0

UNIT	BULK TOT	CON T/E	MO	OMA	CON BULK	SQ T/E	CON SQ T/E	CON SQ
[illegible]	1757.7	1596.4	59.6	0.0	1656.0	328.4	309.7	311.0
[illegible]	186.0	90.8	83.1	0.0	173.0	4662.9	4193.3	4140.0
[illegible]	186.0	90.8	83.1	0.0	173.0	4662.9	4193.3	4140.0
[illegible]	186.0	90.8	83.1	0.0	173.0	4662.9	4193.3	4140.0
M1033	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
[illegible]	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
[illegible]	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
M1033	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
M1033	1014.4	553.2	427.3	0.0	980.0	4425.8	4161.1	4195.0
M1038	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4195.0
M1038	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
M1038	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
M1128	1678.5	344.7	1312.8	0.0	1657.0	23015.7	21634.8	21818.0
M1128	1678.5	344.7	1312.8	0.0	1657.0	23015.7	21634.8	21818.0
M4233	905.7	526.5	345.9	0.0	872.0	6531.0	6139.1	6191.0
M4233	905.7	526.5	345.9	0.0	872.0	6531.0	6139.1	6191.0
M4233	905.7	526.5	345.9	0.0	872.0	6531.0	6139.1	6191.0
M1423	437.3	394.6	17.6	0.0	412.0	69.4	65.3	65.0
M1423	437.3	394.6	17.6	0.0	412.0	69.4	65.3	65.0
M1423	437.3	394.6	17.6	0.0	412.0	69.4	65.3	65.0
M1373X	70.9	24.2	43.5	0.0	67.0	1096.3	964.7	973.0
M1373X	70.9	24.2	43.5	0.0	67.0	1096.3	964.7	973.0
M1373X	70.9	24.2	43.5	0.0	67.0	1096.3	964.7	973.0
M1373X	70.9	24.2	43.5	0.0	67.0	1096.3	964.7	973.0
M4652	110.3	38.8	69.2	0.0	107.0	15292.2	14374.7	14496.0
M4652	110.3	38.8	69.2	0.0	107.0	15292.2	14374.7	14496.0
M4652	110.3	38.8	69.2	0.0	107.0	15292.2	14374.7	14496.0
M1843X	99.5	64.3	28.4	0.0	92.0	1961.4	1726.0	1741.0
M1864X	345.1	114.1	215.6	0.0	329.0	12631.4	11115.6	11216.0
M1862X	135.7	49.5	79.7	0.0	129.0	23312.4	20514.9	20700.0
M1038	1014.4	553.2	427.3	0.0	980.0	4426.8	4161.1	4196.0
M1128	1678.5	344.7	1312.8	0.0	1657.0	23015.7	21634.8	21818.0
M1196	959.0	534.5	362.0	0.0	896.0	17363.7	15280.1	15418.0
M1383X	2313.5	1039.1	1147.1	0.0	2186.0	31214.4	27468.7	27717.0
M4237	847.1	614.2	149.5	0.0	763.0	16832.0	14812.1	14946.0
M4233	905.7	526.5	345.9	0.0	872.0	6531.0	6139.1	6191.0
M4652	110.3	38.8	69.2	0.0	107.0	15292.2	14374.7	14496.0
M4903	35.0	17.3	13.9	0.0	31.0	605.2	496.2	501.0
M4903	35.0	17.3	13.9	0.0	31.0	605.2	496.2	501.0
M4903	35.0	17.3	13.9	0.0	31.0	605.2	496.2	501.0
M4907	95.5	40.0	47.1	0.0	87.0	6295.9	5162.6	5212.0
M3857X	393.1	197.4	174.0	0.0	371.0	10956.8	9641.9	9729.0
M3853X	58.6	32.8	21.4	0.0	54.0	1900.9	1672.8	1687.0
M3853X	58.6	32.8	21.4	0.0	54.0	1900.9	1672.8	1687.0
M3853X	58.6	32.8	21.4	0.0	54.0	1900.9	1672.8	1687.0
M3853X	58.6	32.8	21.4	0.0	54.0	1900.9	1672.8	1687.0

M1423	437.3	394.6	17.6	0.0	412.0	59.4	65.3	65.0
M1427	115.2	67.5	38.7	0.0	106.0	6470.5	5694.0	5745.0
M8625X	172.2	104.3	53.9	0.0	158.0	3640.0	3203.2	3232.0
M1988	847.3	534.0	243.0	0.0	777.0	10485.5	9227.2	9310.0
M1377X	118.4	78.9	28.9	0.0	107.0	787.7	693.2	699.0
[illegible]	158.7	49.5	102.6	0.0	152.0	6561.7	5774.3	5826.0
[illegible]	226.2	114.0	105.3	0.0	219.0	11536.1	10844.0	10935.0
CHD GP	1932.1	1101.3	684.6	0.0	1785.0	85992.3	75673.2	76357.0
M8612X	386.2	138.0	218.4	0.0	356.0	16526.4	13551.6	13683.0
[illegible]	1005.4	253.5	717.5	0.0	971.0	13757.5	12106.6	12216.0
M8640X	321.6	121.6	173.5	0.0	295.0	7934.9	6505.5	6569.0
M8915X	196.1	109.9	62.3	0.0	172.0	2870.1	2353.5	2376.0
M8937X	1216.8	944.4	212.5	4.0	1160.0	3163.8	1887.3	1912.0
M8937X	1216.8	944.4	212.5	4.0	1160.0	3163.8	1887.3	1912.0
M8937X	1216.8	944.4	212.5	4.0	1160.0	3163.8	1887.3	1912.0
M8937X	1216.8	944.4	212.5	4.0	1160.0	3163.8	1887.3	1912.0
M8937X	1216.8	944.4	212.5	4.0	1160.0	3163.8	1887.3	1912.0
M8943X	1290.6	956.9	273.0	34.8	1264.0	3896.0	2435.5	2466.0
M8943X	1290.6	955.9	273.0	34.8	1264.0	3896.0	2435.5	2466.0
M8943X	1290.6	956.9	273.0	34.8	1264.0	3896.0	2435.5	2466.0
M8470X	1149.6	943.1	146.7	1.2	1099.0	2669.7	1459.0	1490.0
M8464X	1108.6	914.5	136.1	1.5	1052.0	2767.0	1934.5	1956.0
M8954X	1108.6	914.5	136.1	1.5	1052.0	2767.0	1934.5	1956.0
M8969X	1305.2	982.6	260.2	5.5	1248.0	3848.4	2565.6	2596.0
M8859X	2000.5	944.4	996.2	1.5	1942.0	5420.8	1996.1	2029.0
M3851X	631.5	92.1	27.9	0.0	119.0	10956.8	8984.5	9071.0
M1985X	62.0	24.7	32.0	0.0	56.0	12516.3	10263.4	10363.0
M4112	663.6	146.1	498.0	0.0	644.0	14468.8	12732.5	12847.0
M4193	416.7	105.2	297.5	0.0	402.0	10497.4	9237.7	9321.0
M8521X	114.9	36.8	73.1	0.0	109.0	4830.5	4250.9	4289.0
M4193	416.7	105.2	297.5	0.0	402.0	10497.4	9237.7	9321.0
M4201	66.6	35.0	27.2	0.0	62.0	2018.9	1776.7	1792.0
M4226	677.2	527.3	78.4	0.0	605.0	8661.0	7621.7	7690.0
M3223X	571.1	369.6	120.8	0.0	490.0	11275.2	9245.7	9335.0
M3243X	814.2	155.4	625.1	0.0	789.0	7131.2	5947.6	5904.0
M3253X	209.6	99.9	88.0	0.0	187.0	2741.2	2247.8	2269.0
M3751X	2219.9	1687.6	162.9	0.0	1850.0	7846.5	6434.1	6496.0
M3753X	801.1	102.8	676.0	0.0	778.0	8884.3	7285.1	7355.0
M3753X	801.1	102.8	676.0	0.0	778.0	8884.3	7285.1	7355.0

FACTORED CARGO CATEGORIES
CONSTRAINT .85 DOS ADJUSTMENT 0

UNIT	BULK TOT	CON T/E	MO	OMA	CON BULK	SO T/E	CON SO T/E	CON SO
M4623M	1757.7	1570.9	59.5	0.0	1630.0	328.4	303.8	306.0
M1096	186.0	87.7	83.0	0.0	170.0	4662.9	3963.4	4000.0
M1095	186.0	87.7	83.0	0.0	170.0	4662.9	3963.4	4000.0
M1095	186.0	87.7	83.0	0.0	170.0	4662.9	3963.4	4000.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1128	1678.5	339.2	1312.3	0.0	1651.0	23015.7	21289.5	21472.0
M1128	1678.5	339.2	1312.3	0.0	1651.0	23015.7	21289.5	21472.0
M4233	905.7	518.1	345.8	0.0	863.0	6531.0	6041.2	6093.0
M4233	905.7	518.1	345.8	0.0	863.0	6531.0	6041.2	6093.0
M4233	905.7	518.1	345.8	0.0	863.0	6531.0	6041.2	6093.0
M1423	437.3	388.3	17.5	0.0	405.0	69.4	64.2	64.0
M1423	437.3	388.3	17.5	0.0	405.0	69.4	64.2	64.0
M1423	437.3	388.3	17.5	0.0	405.0	69.4	64.2	64.0
M1373X	70.9	23.4	43.4	0.0	66.0	1096.3	931.8	940.0
M1373X	70.9	23.4	43.4	0.0	66.0	1096.3	931.8	940.0
M1373X	70.9	23.4	43.4	0.0	66.0	1096.3	931.8	940.0
M1373X	70.9	23.4	43.4	0.0	66.0	1096.3	931.8	940.0
M4652	110.3	38.2	69.1	0.0	107.0	15292.2	14145.3	14267.0
M4652	110.3	38.2	69.1	0.0	107.0	15292.2	14145.3	14267.0
M4652	110.3	38.2	69.1	0.0	107.0	15292.2	14145.3	14267.0
M1863X	99.5	62.2	27.4	0.0	89.0	1961.4	1667.2	1682.0
M1864X	345.1	110.2	215.5	0.0	325.0	12631.4	10736.7	10837.0
M1862X	135.7	47.8	79.6	0.0	127.0	23312.4	19815.5	20001.0
M1038	1014.4	544.4	426.6	0.0	971.0	4426.8	4094.7	4129.0
M1128	1678.5	339.2	1312.3	0.0	1651.0	23015.7	21289.5	21472.0
M1196	969.0	516.3	361.8	0.0	878.0	17363.7	14759.2	14897.0
M1353X	2313.5	1003.7	1139.9	0.0	2143.0	31214.4	26532.3	26780.0
M4237	847.1	593.3	149.4	0.0	742.0	16832.0	14307.2	14441.0
M4233	905.7	518.1	345.8	0.0	863.0	6531.0	6041.2	6093.0
M4652	110.3	38.2	69.1	0.0	107.0	15292.2	14145.3	14267.0
M4903	35.0	16.4	13.9	0.0	30.0	605.2	469.0	473.0
M4903	35.0	16.4	13.9	0.0	30.0	605.2	469.0	473.0
M4903	35.0	16.4	13.9	0.0	30.0	605.2	469.0	473.0
M4907	95.6	37.8	47.0	0.0	84.0	6295.9	4879.3	4929.0
M3857X	398.1	190.7	173.9	0.0	364.0	10956.8	9313.2	9400.0
M3853X	58.6	31.7	21.4	0.0	53.0	1900.9	1615.7	1630.0
M3853X	58.6	31.7	21.4	0.0	53.0	1900.9	1615.7	1630.0
M3853X	58.6	31.7	21.4	0.0	53.0	1900.9	1615.7	1630.0
M3853X	58.6	31.7	21.4	0.0	53.0	1900.9	1615.7	1630.0

M1423	437.3	388.3	17.5	0.0	405.0	69.4	64.2	64.0
M1427	115.2	65.2	38.6	0.0	103.0	6470.5	5499.9	5551.0
M3625X	172.2	100.8	53.8	0.0	154.0	3640.0	3094.0	3122.0
[illegible]	647.3	515.8	241.7	0.0	757.0	10485.5	8912.7	8996.0
[illegible]	118.4	76.2	28.8	0.0	104.0	787.7	669.6	675.0
[illegible]	158.7	47.9	102.5	0.0	150.0	6561.7	5577.5	5629.0
[illegible]	226.2	112.2	105.1	0.0	217.0	11536.1	10670.9	10762.0
[illegible]	1932.1	1063.7	682.7	0.0	1746.0	85992.3	73093.4	73778.0
[illegible]	386.2	130.4	218.2	0.0	348.0	16526.4	12808.0	12939.0
M8631X	1005.4	244.9	717.4	0.0	962.0	13757.5	11693.8	11803.0
M8640X	321.6	114.9	173.4	0.0	288.0	7934.8	6149.5	6212.0
M8615X	135.1	103.8	62.2	0.0	166.0	2870.1	2224.4	2247.0
M8937X	1216.8	924.5	212.3	4.0	1140.0	3163.8	1857.2	1882.0
M8937X	1216.8	924.5	212.3	4.0	1140.0	3163.8	1857.2	1882.0
M8937X	1216.8	924.5	212.3	4.0	1140.0	3163.8	1857.2	1882.0
M8937X	1216.8	924.5	212.3	4.0	1140.0	3163.8	1857.2	1882.0
M8937X	1216.8	924.5	212.3	4.0	1140.0	3163.8	1857.2	1882.0
M8943X	1290.6	900.5	272.8	34.8	1208.0	3896.0	2396.7	2427.0
M8943X	1290.6	900.5	272.8	34.8	1208.0	3896.0	2396.7	2427.0
M8943X	1290.6	900.5	272.8	34.8	1208.0	3896.0	2396.7	2427.0
M8970X	1149.6	926.6	146.5	1.2	1074.0	2669.7	1445.5	1466.0
M8964X	1108.6	898.1	136.0	1.5	1035.0	2767.0	1903.6	1925.0
M8964X	1108.6	898.1	136.0	1.5	1035.0	2767.0	1903.6	1925.0
M8968X	1305.2	960.3	260.1	5.5	1225.0	3848.4	2524.7	2555.0
M8859X	2000.6	927.5	996.1	1.5	1925.0	5420.8	1954.4	1997.0
M3851X	631.5	87.0	27.5	0.0	114.0	10956.8	8491.5	8578.0
M1985X	62.0	23.4	31.9	0.0	55.0	12516.3	9700.2	9799.0
M4112	663.6	141.1	497.8	0.0	638.0	14468.8	12298.5	12413.0
M4193	416.7	101.6	297.3	0.0	398.0	10497.4	8922.8	9006.0
M8621X	114.9	35.6	73.1	0.0	108.0	4830.5	4106.0	4144.0
M4193	416.7	101.6	297.3	0.0	398.0	10497.4	8922.8	9006.0
M4201	66.6	33.8	27.1	0.0	60.0	2018.9	1716.1	1732.0
M4226	677.2	509.3	78.2	0.0	587.0	8661.0	7361.9	7430.0
M3223X	571.1	349.3	120.6	0.0	469.0	11275.2	8738.3	8828.0
M3243X	814.2	146.8	624.9	0.0	771.0	7131.2	5526.7	5583.0
M3253X	209.6	94.4	87.9	0.0	182.0	2741.2	2124.4	2146.0
M3751X	2219.9	1594.9	162.4	0.0	1757.0	7846.5	6081.1	6143.0
M3753X	801.1	97.2	675.9	0.0	773.0	8884.3	6885.3	6956.0
M3753X	801.1	97.2	675.9	0.0	773.0	8884.3	6885.3	6956.0

M8914X	179.6	89.4	64.3	.0	153.0	4800.8	1984.6	2022.0
M8914X	179.6	89.4	64.3	.0	153.0	4800.8	1984.6	2022.0
M8921	3238.2	2316.6	254.6	0.0	2571.0	17236.7	13358.5	13495.0
M8921	3238.2	2316.6	254.6	0.0	2571.0	17236.7	13358.5	13495.0
M8321	87.0	41.3	33.8	0.0	75.0	2180.6	1690.0	1707.0
M8321	87.0	41.3	33.8	0.0	75.0	2180.6	1690.0	1707.0

FACTORED CARGO CATEGORIES
CONSTRAINT .75 DOS ADJUSTMENT 0

UNIT	BULK TOT	CON T/E	MD	DMA	CON BULK	SO T/E	CON SO T/E	CON SO
M1523M	1757.7	1486.0	59.5	0.0	1545.0	328.4	287.3	289.0
M1046	186.0	77.4	83.0	0.0	160.0	4662.9	3497.2	3534.0
M1046	186.0	77.4	83.0	0.0	160.0	4662.9	3497.2	3534.0
M1046	186.0	77.4	83.0	0.0	160.0	4662.9	3497.2	3534.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1128	1678.5	320.8	1312.3	0.0	1633.0	23015.7	20138.8	20322.0
M1128	1678.5	320.8	1312.3	0.0	1633.0	23015.7	20138.8	20322.0
M4233	905.7	490.1	345.8	0.0	835.0	6531.0	5714.6	5766.0
M4233	905.7	490.1	345.8	0.0	835.0	6531.0	5714.6	5766.0
M4233	905.7	490.1	345.8	0.0	835.0	6531.0	5714.6	5766.0
M1423	437.3	367.3	17.5	0.0	384.0	69.4	60.8	61.0
M1423	437.3	367.3	17.5	0.0	384.0	69.4	60.8	61.0
M1423	437.3	367.3	17.5	0.0	384.0	69.4	60.8	61.0
M1373X	70.9	20.6	43.4	0.0	64.0	1096.3	822.2	830.0
M1373X	70.9	20.6	43.4	0.0	64.0	1096.3	822.2	830.0
M1373X	70.9	20.6	43.4	0.0	64.0	1096.3	822.2	830.0
M1373X	70.9	20.6	43.4	0.0	64.0	1096.3	822.2	830.0
M4652	110.3	36.1	69.1	0.0	105.0	15292.2	13380.7	13502.0
M4652	110.3	36.1	69.1	0.0	105.0	15292.2	13380.7	13502.0
M4652	110.3	36.1	69.1	0.0	105.0	15292.2	13380.7	13502.0
M1863X	99.5	54.8	27.4	0.0	82.0	1961.4	1471.0	1486.0
M1864X	345.1	97.3	215.5	0.0	312.0	12631.4	9473.6	9574.0
M1862X	135.7	42.2	79.6	0.0	121.0	23312.4	17484.3	17669.0
M1038	1014.4	515.0	426.6	0.0	941.0	4426.8	3873.4	3908.0
M1128	1678.5	320.8	1312.3	0.0	1633.0	23015.7	20138.8	20322.0
M1196	969.0	455.5	361.8	0.0	817.0	17363.7	13022.8	13161.0
M1363X	2313.5	885.6	1139.9	0.0	2025.0	31214.4	23410.8	23659.0
M4237	847.1	523.5	149.4	0.0	672.0	16832.0	12624.0	12758.0
M4233	905.7	490.1	345.8	0.0	835.0	6531.0	5714.6	5766.0
M4652	110.3	36.1	69.1	0.0	105.0	15292.2	13380.7	13502.0
M4903	35.0	13.2	13.9	0.0	27.0	605.2	378.2	383.0
M4903	35.0	13.2	13.9	0.0	27.0	605.2	378.2	383.0
M4903	35.0	13.2	13.9	0.0	27.0	605.2	378.2	383.0
M4907	95.6	30.5	47.0	0.0	77.0	6295.9	3934.9	3985.0
M3857X	398.1	168.3	173.9	0.0	342.0	10956.8	8217.6	8304.0
M3853X	58.6	27.9	21.4	0.0	49.0	1900.9	1425.6	1440.0
M3853X	58.6	27.9	21.4	0.0	49.0	1900.9	1425.6	1440.0
M3853X	58.6	27.9	21.4	0.0	49.0	1900.9	1425.6	1440.0
M3853X	58.6	27.9	21.4	0.0	49.0	1900.9	1425.6	1440.0

M1423	437.3	367.3	17.5	0.0	384.0	69.4	60.8	61.0
M1427	115.2	57.5	38.6	0.0	96.0	6470.5	4852.9	4904.0
M8625X	172.2	88.9	53.8	0.0	142.0	3640.0	2730.0	2758.0
M1983	847.1	455.1	241.7	0.0	696.0	10485.5	7864.1	7947.0
M1377X	119.4	67.2	28.8	0.0	96.0	787.7	598.8	597.0
M1867X	158.7	42.2	102.5	0.0	144.0	6561.7	4921.3	4973.0
M4554	226.2	106.1	105.1	0.0	211.0	11536.1	10094.1	10185.0
C90 GP	1932.1	938.6	682.7	0.0	1621.0	85992.3	64494.2	65178.0
M3612X	386.2	105.2	218.2	0.0	323.0	16526.4	10329.0	10460.0
M8631X	1005.4	216.1	717.4	0.0	933.0	13757.5	10318.1	10427.0
M8640X	321.6	92.7	173.4	0.0	266.0	7934.8	4959.3	5022.0
M8515X	196.1	83.7	62.2	0.0	145.0	2870.1	1793.8	1816.0
M8937X	1216.8	874.6	212.3	4.0	1090.0	3163.8	1756.8	1782.0
M8937X	1216.8	874.6	212.3	4.0	1090.0	3163.8	1756.8	1782.0
M8937X	1216.8	874.6	212.3	4.0	1090.0	3163.8	1756.8	1782.0
M8937X	1216.8	874.6	212.3	4.0	1090.0	3163.8	1756.8	1782.0
M8937X	1216.8	874.6	212.3	4.0	1090.0	3163.8	1756.8	1782.0
M8943X	1290.6	851.8	272.8	34.8	1159.0	3896.0	2267.1	2298.0
M8943X	1290.6	851.8	272.8	34.8	1159.0	3896.0	2267.1	2298.0
M8943X	1290.6	851.8	272.8	34.8	1159.0	3896.0	2267.1	2298.0
M8970X	1149.6	876.6	146.5	1.2	1024.0	2669.7	1367.4	1388.0
M8964X	1108.6	849.6	136.0	1.5	987.0	2767.0	1800.7	1822.0
M8964X	1108.6	849.6	136.0	1.5	987.0	2767.0	1800.7	1822.0
M8968X	1305.2	908.4	260.1	5.5	1174.0	3848.4	2388.2	2418.0
M8859X	2000.6	877.4	996.1	1.5	1875.0	5420.8	1848.7	1891.0
M3851X	631.5	70.2	27.5	0.0	97.0	10956.8	6848.0	6935.0
M1985X	62.0	18.8	31.9	0.0	50.0	12516.3	7822.7	7922.0
M4112	663.6	124.5	497.8	0.0	622.0	14468.8	10851.6	10966.0
M4193	416.7	89.7	297.3	0.0	386.0	10497.4	7873.1	7956.0
M8621X	114.9	31.4	73.1	0.0	104.0	4830.5	3622.9	3661.0
M4193	416.7	89.7	297.3	0.0	386.0	10497.4	7873.1	7956.0
M4201	66.6	29.8	27.1	0.0	56.0	2018.9	1514.2	1530.0
M4226	677.2	449.4	78.2	0.0	527.0	8661.0	6495.8	6564.0
M3223X	571.1	281.7	120.6	0.0	402.0	11275.2	7047.0	7136.0
M3243X	814.2	118.4	624.9	0.0	743.0	7131.2	4457.0	4513.0
M3253X	209.6	76.1	87.9	0.0	164.0	2741.2	1713.2	1735.0
M3751X	2219.9	1286.2	162.4	0.0	1448.0	7846.5	4904.1	4966.0
M3753X	801.1	78.4	675.9	0.0	754.0	8884.3	5552.7	5623.0
M3753X	801.1	78.4	675.9	0.0	754.0	8884.3	5552.7	5623.0

M8914X	179.6	72.1	64.3	.0	136.0	4800.8	1600.5	1638.0
M8914X	179.6	72.1	64.3	.0	136.0	4800.8	1600.5	1638.0
M8921	3238.2	1868.3	254.6	0.0	2122.0	17236.7	10773.0	10910.0
M8921	3238.2	1868.3	254.6	0.0	2122.0	17236.7	10773.0	10910.0
[illegible]	87.0	33.3	33.8	0.0	67.0	2180.6	1362.9	1380.0
[illegible]	87.0	33.3	33.8	0.0	67.0	2180.6	1362.9	1380.0

FACTORED CARGO CATEGORIES
CONSTRAINT .70 DOS ADJUSTMENT 0

UNIT	BULK TOT	CON T/E	MU	OMA	CON BULK	SO T/E	CON SO T/E	CON SO
M4623M	1757.7	1443.6	59.5	0.0	1503.0	328.4	279.1	281.0
M1096	186.0	72.2	83.0	0.0	155.0	4662.9	3264.0	3301.0
M1096	186.0	72.2	83.0	0.0	155.0	4662.9	3264.0	3301.0
M1096	186.0	72.2	83.0	0.0	155.0	4662.9	3264.0	3301.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1128	1678.5	311.7	1312.3	0.0	1623.0	23015.7	19563.4	19746.0
M1128	1678.5	311.7	1312.3	0.0	1623.0	23015.7	19563.4	19746.0
M4233	905.7	476.1	345.8	0.0	821.0	6531.0	5551.3	5603.0
M4233	905.7	476.1	345.8	0.0	821.0	6531.0	5551.3	5603.0
M4233	905.7	476.1	345.8	0.0	821.0	6531.0	5551.3	5603.0
M1423	437.3	356.8	17.5	0.0	374.0	69.4	59.0	59.0
M1423	437.3	356.8	17.5	0.0	374.0	69.4	59.0	59.0
M1423	437.3	356.8	17.5	0.0	374.0	69.4	59.0	59.0
M1373X	70.9	19.2	43.4	0.0	62.0	1096.3	767.4	776.0
M1373X	70.9	19.2	43.4	0.0	62.0	1096.3	767.4	776.0
M1373X	70.9	19.2	43.4	0.0	62.0	1096.3	767.4	776.0
M1373X	70.9	19.2	43.4	0.0	62.0	1096.3	767.4	776.0
M4652	110.3	35.1	69.1	0.0	104.0	15292.2	12998.4	13120.0
M4652	110.3	35.1	69.1	0.0	104.0	15292.2	12998.4	13120.0
M4652	110.3	35.1	69.1	0.0	104.0	15292.2	12998.4	13120.0
M1863X	99.5	51.2	27.4	0.0	78.0	1961.4	1373.0	1388.0
M1864X	345.1	90.8	215.5	0.0	306.0	12631.4	8842.0	8942.0
M1862X	135.7	39.4	79.6	0.0	118.0	23312.4	16318.7	16504.0
M1038	1014.4	500.3	426.6	0.0	926.0	4426.8	3762.7	3797.0
M1128	1678.5	311.7	1312.3	0.0	1623.0	23015.7	19563.4	19746.0
M1196	969.0	425.2	361.8	0.0	786.0	17363.7	12154.6	12292.0
M1363X	2313.5	826.6	1139.9	0.0	1966.0	31214.4	21850.1	22098.0
M4237	847.1	488.6	149.4	0.0	637.0	16832.0	11782.4	11916.0
M4233	905.7	476.1	345.8	0.0	821.0	6531.0	5551.3	5603.0
M4652	110.3	35.1	69.1	0.0	104.0	15292.2	12998.4	13120.0
M4903	35.0	11.6	13.9	0.0	25.0	605.2	332.8	337.0
M4903	35.0	11.6	13.9	0.0	25.0	605.2	332.8	337.0
M4903	35.0	11.6	13.9	0.0	25.0	605.2	332.8	337.0
M4907	95.6	26.8	47.0	0.0	73.0	6295.9	3462.7	3512.0
M3857X	398.1	157.1	173.9	0.0	330.0	10956.8	7669.7	7756.0
M3853X	58.6	26.1	21.4	0.0	47.0	1900.9	1330.6	1345.0
M3853X	58.6	26.1	21.4	0.0	47.0	1900.9	1330.6	1345.0
M3853X	58.6	26.1	21.4	0.0	47.0	1900.9	1330.6	1345.0
M3853X	58.6	26.1	21.4	0.0	47.0	1900.9	1330.6	1345.0

M1423	437.3	356.8	17.5	0.0	374.0	69.4	59.0	59.0
M1427	115.2	53.7	38.6	0.0	92.0	6470.5	4529.3	4580.0
M8625X	172.2	83.0	53.8	0.0	136.0	3640.0	2548.0	2576.0
M1784	847.3	424.8	241.7	0.0	666.0	10485.5	7339.9	7423.0
[illegible]	118.4	62.8	28.8	0.0	91.0	787.7	551.4	557.0
M1867X	158.7	39.4	102.5	0.0	141.0	6561.7	4593.2	4645.0
M4654	226.2	103.1	105.1	0.0	208.0	11536.1	9805.7	9897.0
[illegible]	1932.1	875.0	682.7	0.0	1558.0	85992.3	60194.6	60879.0
[illegible]	335.2	92.5	218.2	0.0	310.0	16526.4	9089.5	9221.0
M8631X	1005.4	201.7	717.4	0.0	919.0	13757.5	9630.2	9739.0
M8640X	321.6	81.6	173.4	0.0	255.0	7934.8	4364.1	4427.0
M8515X	195.1	73.7	62.2	0.0	135.0	2870.1	1578.6	1601.0
M8937X	1216.8	849.6	212.3	4.0	1065.0	3163.8	1706.6	1731.0
M8937X	1216.8	849.6	212.3	4.0	1065.0	3163.8	1706.6	1731.0
M8937X	1216.8	849.6	212.3	4.0	1065.0	3163.8	1706.6	1731.0
M8937X	1216.8	849.6	212.3	4.0	1065.0	3163.8	1706.6	1731.0
M8937X	1216.8	849.6	212.3	4.0	1065.0	3163.8	1706.6	1731.0
M8943X	1290.6	827.5	272.8	34.8	1135.0	3896.0	2202.3	2233.0
M8943X	1290.6	827.5	272.8	34.8	1135.0	3896.0	2202.3	2233.0
M8943X	1290.6	827.5	272.8	34.8	1135.0	3896.0	2202.3	2233.0
M8970X	1149.6	851.5	146.5	1.2	999.0	2669.7	1328.3	1349.0
M8964X	1108.6	825.3	136.0	1.5	962.0	2767.0	1749.3	1771.0
M8964X	1108.6	825.3	136.0	1.5	962.0	2767.0	1749.3	1771.0
M8968X	1305.2	882.5	260.1	5.5	1148.0	3848.4	2320.0	2350.0
M8859X	2000.6	852.3	996.1	1.5	1849.0	5420.8	1795.9	1839.0
M3851X	631.5	61.7	27.5	0.0	89.0	10956.8	6026.2	6113.0
M1985X	62.0	16.6	31.9	0.0	48.0	12516.3	6884.0	6983.0
M4112	663.6	116.2	497.8	0.0	613.0	14468.8	10128.2	10243.0
M4193	416.7	83.7	297.3	0.0	381.0	10497.4	7348.2	7431.0
M8621X	114.9	29.3	73.1	0.0	102.0	4830.5	3381.4	3419.0
M4193	416.7	83.7	297.3	0.0	381.0	10497.4	7348.2	7431.0
M4201	66.6	27.8	27.1	0.0	54.0	2018.9	1413.2	1429.0
M4226	677.2	419.4	78.2	0.0	497.0	8661.0	6062.7	6131.0
M3223X	571.1	247.9	120.6	0.0	368.0	11275.2	6201.4	6291.0
M3243X	814.2	104.2	624.9	0.0	729.0	7131.2	3922.2	3978.0
M3253X	209.6	67.0	87.9	0.0	154.0	2741.2	1507.6	1529.0
M3751X	2219.9	1131.9	162.4	0.0	1294.0	7846.5	4315.6	4378.0
M3753X	801.1	69.0	675.9	0.0	744.0	8884.3	4886.3	4957.0
M3753X	801.1	69.0	675.9	0.0	744.0	8884.3	4886.3	4957.0

M8914X	179.6	63.5	64.3	.0	127.0	4800.8	1408.4	1446.0
M8914X	179.6	63.5	64.3	.0	127.0	4800.8	1408.4	1446.0
M8921	3238.2	1644.1	254.6	0.0	1898.0	17236.7	9480.2	9617.0
M8921	3238.2	1644.1	254.6	0.0	1898.0	17236.7	9480.2	9617.0
M8921	87.0	29.3	33.8	0.0	63.0	2180.6	1199.3	1216.0
M8921	87.0	29.3	33.8	0.0	63.0	2180.6	1199.3	1216.0

Appendix C

SAMPLES OF COMPUTER OUTPUT

Part 3: Example of Constrained Cargo Factoring Model Output: Constrained Cargo

CONSTRAINED CUBE FOR CLASS IIW AND VIIW NON SQUARE AND VIIW SQUARE T/E

CONSTRAINT= .90

UNIT	CON BULK	BULK	CON SQ	SQUARE
M4623M	1613.	1698.	314	328.
M1096	93.	103.	4233	4663.
M1096	93.	103.	4233	4663.
M1096	93.	103.	4233	4663.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1038	559.	589.	4240	4427.
M1128	348.	367.	22048	23016.
M1128	348.	367.	22048	23016.
M4233	532.	560.	6256	6531.
M4233	532.	560.	6256	6531.
M4233	532.	560.	6256	6531.
M1423	399.	420.	66	69.
M1423	399.	420.	66	69.
M1423	399.	420.	66	69.
M1373X	25.	27.	995	1096.
M1373X	25.	27.	995	1096.
M1373X	25.	27.	995	1096.
M1373X	25.	27.	995	1096.
M4652	39.	41.	14649	15292.
M4652	39.	41.	14649	15292.
M4652	39.	41.	14649	15292.
M1863X	66.	73.	1780	1961.
M1864X	117.	130.	11468	12631.
M1862X	51.	56.	21166	23312.
M1038	559.	589.	4240	4427.
M1128	348.	367.	22048	23016.
M1196	547.	607.	15765	17364.
M1363X	1063.	1181.	28341	31214.
M4237	628.	698.	15282	16832.
M4233	532.	560.	6256	6531.
M4652	39.	41.	14649	15292.
M4903	18.	21.	519	605.
M4903	18.	21.	519	605.
M4903	18.	21.	519	605.
M4907	41.	49.	5401	6296.
M3857X	202.	224.	9948	10957.
M3853X	34.	37.	1725	1901.
M3853X	34.	37.	1725	1901.
M3853X	34.	37.	1725	1901.
M3853X	34.	37.	1725	1901.

M1423	399.	420.	66	69.
M1427	69.	77.	5874	6470.
M8525X	107.	119.	3304	3640.
M1988	546.	607.	9520	10486.
M1377X	81.	90.	715	788.
M1867X	51.	56.	5957	6562.
M4654	115.	121.	11051	11536.
CMD GP	1126.	1251.	78077	85992.
M8612X	143.	168.	14179	16526.
M8631X	259.	288.	12491	13757.
M8640X	126.	148.	6807	7935.
M8615X	114.	134.	2462	2870.
M8937X	950.	999.	1932	3164.
M8937X	950.	999.	1932	3164.
M8937X	950.	999.	1932	3164.
M8937X	950.	999.	1932	3164.
M8937X	950.	999.	1932	3164.
M8943X	925.	973.	2492	3896.
M8943X	925.	973.	2492	3896.
M8943X	925.	973.	2492	3896.
M8970X	952.	1002.	1505	2670.
M8964X	922.	971.	1977	2767.
M8954X	922.	971.	1977	2767.
M8968X	986.	1038.	2623	3848.
M8859X	953.	1003.	2050	5421.
M3851X	95.	112.	9400	10957.
M1985X	26.	30.	10739	12516.
M4112	149.	166.	13137	14469.
M4193	108.	120.	9531	10497.
M8621X	38.	42.	4385	4831.
M4193	108.	120.	9531	10497.
M4201	36.	40.	1833	2019.
M4226	539.	599.	7863	8661.
M3223X	383.	451.	9673	11275.
M3243X	161.	189.	6118	7131.
M3253X	104.	122.	2351	2741.
M3751X	1749.	2058.	6732	7847.
M3753X	107.	125.	7622	8884.
M3753X	107.	125.	7622	8884.

M8914X	98.	115.	2214	4801.
M8914X	98.	115.	2214	4801.
M8921	2541.	2989.	14788	17237.
M8921	2541.	2989.	14788	17237.
M8821	45.	53.	1870	2181.
M8821	45.	53.	1870	2181.

CONSTRAINED CUBE FOR CLASS IIW AND VIIW NON SQUARE AND VIIW SQUARE T/E

CONSTRAINT= .88

UNIT	CON BULK	BULK	CON SQ	SQUARE
M4623M	1596.	1598.	311	328.
M1096	91.	103.	4140	4663.
M1096	91.	103.	4140	4663.
M1096	91.	103.	4140	4663.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1038	553.	589.	4196	4427.
M1128	345.	367.	21818	23016.
M1128	345.	367.	21818	23016.
M4233	526.	560.	6191	6531.
M4233	526.	560.	6191	6531.
M4233	526.	560.	6191	6531.
M1423	395.	420.	65	69.
M1423	395.	420.	65	69.
M1423	395.	420.	65	69.
M1373X	24.	27.	973	1096.
M1373X	24.	27.	973	1096.
M1373X	24.	27.	973	1096.
M1373X	24.	27.	973	1096.
M4652	39.	41.	14496	15292.
M4652	39.	41.	14496	15292.
M4652	39.	41.	14496	15292.
M1863X	64.	73.	1741	1961.
M1864X	114.	130.	11216	12631.
M1862X	49.	56.	20700	23312.
M1038	553.	589.	4196	4427.
M1128	345.	367.	21818	23016.
M1196	534.	607.	15418	17364.
M1363X	1039.	1181.	27717	31214.
M4237	614.	698.	14946	16832.
M4233	526.	560.	6191	6531.
M4652	39.	41.	14496	15292.
M4903	17.	21.	501	605.
M4903	17.	21.	501	605.
M4903	17.	21.	501	605.
M4907	40.	49.	5212	6296.
M3857X	197.	224.	9729	10957.
M3853X	33.	37.	1687	1991.
M3853X	33.	37.	1687	1991.
M3853X	33.	37.	1687	1991.
M3853X	33.	37.	1687	1991.

M1423	395.	420.	65	69.
M1427	68.	77.	5745	6470.
M3625X	104.	119.	3232	3640.
M1988	534.	607.	9310	10486.
M1377X	79.	90.	697	788.
M1867X	50.	56.	5826	6562.
M3654	114.	121.	10935	11536.
CMD GP	1101.	1251.	76357	85932.
M3612X	138.	168.	13683	16526.
M8631X	254.	288.	12216	13757.
M8640X	122.	146.	6569	7935.
M8615X	110.	134.	2376	2679.
M8937X	944.	1005.	1912	3164.
M8937X	944.	1005.	1912	3164.
M8937X	944.	1005.	1912	3164.
M8937X	944.	1005.	1912	3164.
M8937X	944.	1005.	1912	3164.
M8943X	957.	1018.	2466	3896.
M8943X	957.	1018.	2466	3896.
M8943X	957.	1018.	2466	3896.
M8970X	943.	1003.	1490	2670.
M8964X	914.	973.	1956	2767.
M8964X	914.	973.	1956	2767.
M3968X	983.	1045.	2596	3848.
M8859X	944.	1005.	2029	5421.
M3851X	92.	112.	9071	10957.
M1985X	25.	30.	10363	12516.
M4112	146.	166.	12847	14469.
M4193	105.	120.	9321	10497.
M8621X	37.	42.	4289	4831.
M4193	105.	120.	9321	10497.
M4201	35.	40.	1792	2019.
M4226	527.	599.	7690	8661.
M3223X	370.	451.	9335	11275.
M3243X	155.	189.	5904	7131.
M3253X	100.	122.	2269	2741.
M3751X	1688.	2058.	6496	7847.
M3753X	103.	125.	7355	8884.
M3753X	103.	125.	7355	8884.

M8914X	95.	115.	2138	4801.
M8914X	95.	115.	2138	4801.
M8921	2451.	2989.	14271	17237.
M8921	2451.	2989.	14271	17237.
M8821	44.	53.	1805	2181.
M8821	44.	53.	1805	2181.

CONSTRAINED CUBE FOR CLASS IIW AND VIIW NON SQUARE AND VIIW SQUARE T/E

CONSTRAINT= .85

UNIT	CON BULK	BULK	CON SQ	SQUARE
M4623M	1571.	1698.	306	328.
M1096	88.	103.	4000	4663.
M1096	88.	103.	4000	4663.
M1096	88.	103.	4000	4663.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1038	544.	589.	4129	4427.
M1128	339.	367.	21472	23016.
M1128	339.	367.	21472	23016.
M4233	518.	560.	6093	6531.
M4233	518.	560.	6093	6531.
M4233	518.	560.	6093	6531.
M1423	388.	420.	64	69.
M1423	388.	420.	64	69.
M1423	388.	420.	64	69.
M1373X	23.	27.	940	1096.
M1373X	23.	27.	940	1096.
M1373X	23.	27.	940	1096.
M1373X	23.	27.	940	1096.
M4652	38.	41.	14267	15292.
M4652	38.	41.	14267	15292.
M4652	38.	41.	14267	15292.
M1863X	62.	73.	1682	1961.
M1864X	110.	130.	10837	12631.
M1862X	48.	56.	20001	23312.
M1038	544.	589.	4129	4427.
M1128	339.	367.	21472	23016.
M1196	516.	607.	14897	17364.
M1363X	1004.	1181.	26780	31214.
M4237	593.	698.	14441	16832.
M4233	518.	560.	6093	6531.
M4652	38.	41.	14267	15292.
M4903	16.	21.	473	605.
M4903	16.	21.	473	605.
M4903	16.	21.	473	605.
M4907	38.	49.	4929	6296.
M3957X	191.	224.	9400	10957.
M3853X	32.	37.	1630	1901.
M3853X	32.	37.	1630	1901.
M3853X	32.	37.	1630	1901.
M3853X	32.	37.	1630	1901.

M1423	388.	420.	64	69.
M1427	65.	77.	5551	6470.
M8625X	101.	119.	3122	3640.
M1933	516.	607.	8996	10486.
M1477X	70.	90.	675	788.
M1897X	48.	56.	5629	6442.
M4654	112.	121.	10762	11536.
CMP GP	1064.	1251.	73778	85992.
M8612X	130.	168.	12939	16526.
M8631X	245.	298.	11803	13757.
M8640X	115.	148.	6212	7935.
M8615X	104.	134.	2247	2870.
M8937X	925.	999.	1882	3164.
M8937X	925.	999.	1882	3164.
M8937X	925.	999.	1882	3164.
M8937X	925.	999.	1882	3164.
M8937X	925.	999.	1882	3164.
M8943X	900.	973.	2427	3896.
M8943X	900.	973.	2427	3896.
M8943X	900.	973.	2427	3896.
M8970X	927.	1002.	1466	2670.
M8964X	898.	971.	1925	2767.
M8964X	898.	971.	1925	2757.
M8968X	960.	1038.	2555	3848.
M8859X	928.	1003.	1997	5421.
M3851X	87.	112.	8578	10957.
M1985X	23.	30.	9799	12516.
M4112	141.	166.	12413	14469.
M4193	102.	120.	9006	10497.
M8621X	36.	42.	4144	4831.
M4193	102.	120.	9006	10497.
M4201	34.	40.	1732	2019.
M4226	509.	599.	7430	8661.
M3223X	349.	451.	8828	11275.
M3243X	147.	189.	5583	7131.
M3253X	94.	122.	2146	2741.
M3751X	1595.	2058.	6143	7847.
M3753X	97.	125.	6956	8884.
M3753X	97.	125.	6956	8884.

M8914X	89.	115.	2022	4801.
M8914X	89.	115.	2022	4801.
M8921	2317.	2989.	13495	17237.
M8921	2317.	2989.	13495	17237.
M8821	41.	53.	1707	2181.
M8821	41.	53.	1707	2181.

CONSTRAINED CUBE FOR CLASS IIW AND VIIW NON SQUARE AND VIIW SQUARE T/F

CONSTRAINT= .75

UNIT	CON BULK	BULK	CON SQ	SQUARE
M4623M	1486.	1698.	289	328.
M1096	77.	103.	3534	4663.
M1096	77.	103.	3534	4663.
M1096	77.	103.	3534	4663.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1038	515.	589.	3908	4427.
M1128	321.	367.	20322	23016.
M1128	321.	367.	20322	23016.
M4233	490.	560.	5766	6531.
M4233	490.	560.	5766	6531.
M4233	490.	560.	5766	6531.
M1423	367.	420.	61	69.
M1423	367.	420.	61	69.
M1423	367.	420.	61	69.
M1373X	21.	27.	830	1096.
M1373X	21.	27.	830	1096.
M1373X	21.	27.	830	1096.
M1373X	21.	27.	830	1096.
M4652	36.	41.	13502	15292.
M4652	36.	41.	13502	15292.
M4652	36.	41.	13502	15292.
M1863X	55.	73.	1486	1961.
M1864X	97.	130.	9574	12631.
M1862X	42.	56.	17669	23312.
M1038	515.	589.	3908	4427.
M1128	321.	367.	20322	23016.
M1196	456.	607.	13161	17364.
M1363X	886.	1181.	23659	31214.
M4237	523.	698.	12758	16832.
M4233	490.	560.	5766	6531.
M4652	36.	41.	13502	15292.
M4903	13.	21.	383	605.
M4903	13.	21.	383	605.
M4903	13.	21.	383	605.
M4907	30.	49.	3985	6296.
M3857X	168.	224.	8304	10957.
M3853X	28.	37.	1440	1901.
M3853X	28.	37.	1440	1901.
M3853X	28.	37.	1440	1901.
M3853X	28.	37.	1440	1901.

M1423	367.	420.	61	69.
M1427	58.	77.	4904	6470.
M8625X	89.	119.	2758	3640.
M1933	455.	607.	7947	10486.
M1377X	67.	90.	597	788.
M1867X	42.	56.	4973	6562.
M4654	106.	121.	10185	11536.
CMD 5P	939.	1251.	65178	85992.
M8612X	105.	168.	10460	16526.
M8631X	216.	288.	10427	13757.
M8640X	93.	148.	5022	7935.
M8615X	84.	134.	1816	2870.
M8937X	875.	999.	1782	3164.
M8937X	875.	999.	1782	3164.
M8937X	875.	999.	1782	3164.
M8937X	875.	999.	1782	3164.
M8937X	875.	999.	1782	3164.
M8943X	852.	973.	2298	3896.
M8943X	852.	973.	2298	3896.
M8943X	852.	973.	2298	3896.
M8970X	877.	1002.	1388	2670.
M8964X	850.	971.	1822	2767.
M8964X	850.	971.	1822	2767.
M8968X	908.	1038.	2418	3848.
M8859X	877.	1003.	1891	5421.
M3851X	70.	112.	6935	10957.
M1985X	19.	30.	7922	12516.
M4112	124.	166.	10966	14469.
M4193	90.	120.	7956	10497.
M8621X	31.	42.	3661	4831.
M4193	90.	120.	7956	10497.
M4201	30.	40.	1530	2019.
M4226	449.	599.	6564	8661.
M3223X	282.	451.	7136	11275.
M3243X	118.	189.	4513	7131.
M3253X	76.	122.	1735	2741.
M3751X	1286.	2058.	4966	7847.
M3753X	78.	125.	5623	8884.
M3753X	78.	125.	5623	8884.

M8914X	72.	115.	1638	4801.
M8914X	72.	115.	1638	4801.
M8921	1868.	2989.	10910	17237.
M8921	1868.	2989.	10910	17237.
M8821	33.	53.	1380	2181.
M8821	33.	53.	1380	2181.

CONSTRAINED CUBE FOR CLASS IIW AND VIIW NON SQUARE AND VIIW SQUARE T/E

CONSTRAINT= .70

UNIT	CON BULK	BULK	CON SQ	SQUARE
M4623M	1444.	1698.	281	328.
M1096	72.	103.	3301	4663.
M1096	72.	103.	3301	4663.
M1096	72.	103.	3301	4663.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1038	500.	589.	3797	4427.
M1128	312.	367.	19746	23016.
M1128	312.	367.	19746	23016.
M4233	476.	560.	5603	6531.
M4233	476.	560.	5603	6531.
M4233	476.	560.	5603	6531.
M1423	357.	420.	59	69.
M1423	357.	420.	59	69.
M1423	357.	420.	59	69.
M1373X	19.	27.	776	1096.
M1373X	19.	27.	776	1096.
M1373X	19.	27.	776	1096.
M1373X	19.	27.	776	1096.
M4652	35.	41.	13120	15292.
M4652	35.	41.	13120	15292.
M4652	35.	41.	13120	15292.
M1863X	51.	73.	1388	1961.
M1864X	91.	130.	8942	12631.
M1862X	39.	56.	16504	23312.
M1038	500.	589.	3797	4427.
M1128	312.	367.	19746	23016.
M1196	425.	607.	12292	17364.
M1363X	827.	1181.	22098	31214.
M4237	489.	698.	11916	16832.
M4233	476.	560.	5603	6531.
M4652	35.	41.	13120	15292.
M4903	12.	21.	337	605.
M4903	12.	21.	337	605.
M4903	12.	21.	337	605.
M4907	27.	49.	3512	6296.
M3857X	157.	224.	7756	10957.
M3853X	26.	37.	1345	1901.
M3853X	26.	37.	1345	1901.
M3853X	26.	37.	1345	1901.
M3853X	26.	37.	1345	1901.

M1423	357.	420.	59	69.
M1427	54.	77.	4580	6470.
M3625X	83.	119.	2576	3640.
M1988	425.	607.	7423	10486.
M1377X	63.	90.	557	788.
M1967X	39.	56.	4645	6562.
M4654	103.	121.	9897	11536.
CMD GP	876.	1251.	60879	85992.
M8612X	93.	168.	9221	16526.
M8631X	202.	288.	9739	13757.
M8640X	82.	148.	4427	7935.
M8615X	74.	134.	1601	2870.
M8937X	850.	999.	1731	3164.
M8937X	850.	999.	1731	3164.
M8937X	850.	999.	1731	3164.
M8937X	850.	999.	1731	3164.
M8937X	850.	999.	1731	3164.
M8943X	827.	973.	2233	3896.
M8943X	827.	973.	2233	3896.
M8943X	827.	973.	2233	3896.
M8970X	852.	1002.	1349	2670.
M8964X	825.	971.	1771	2767.
M8964X	825.	971.	1771	2767.
M8968X	882.	1038.	2350	3848.
M8359X	852.	1003.	1839	5421.
M3851X	62.	112.	6113	10957.
M1985X	17.	30.	6983	12516.
M4112	116.	166.	10243	14469.
M4193	84.	120.	7431	10497.
M3621X	29.	42.	3419	4831.
M4193	84.	120.	7431	10497.
M4201	28.	40.	1429	2019.
M4226	419.	599.	6131	8661.
M3223X	248.	451.	6291	11275.
M3243X	104.	189.	3978	7131.
M3253X	67.	122.	1529	2741.
M3751X	1132.	2058.	4378	7847.
M3753X	69.	125.	4957	8884.
M3753X	69.	125.	4957	8884.

M8914X	63.	115.	1446	4801.
M8914X	63.	115.	1446	4801.
M8921	1644.	2989.	9617	17237.
M8921	1644.	2989.	9617	17237.
M8821	29.	53.	1216	2181.
M8821	29.	53.	1216	2181.

Appendix C

SAMPLES OF COMPUTER OUTPUT

Part 4: Example of Constrained T/E Embarkation Analysis Model Output

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Appendix C

SAMPLES OF COMPUTER OUTPUT

Part 4: Example of Constrained T/E Embarkation Analysis Model Output

I INTRODUCTION

Part 4 of Appendix C is a series of constrained T/Es computed by the Constrained T/E Embarkation Analysis Model (CONTEAM) for a sample of ten representative FMF units. For each unit, three tentative constrained T/Es are included--one for each constraint (90%, 85%, and 75%) applied to the unit's fully authorized T/E. Each constraint is applied equally to both square and cube items in the listings; however, CONTEAM is capable of calculating a constrained T/E for a unit with different constraints for square and cube even though such a case isn't presented in the tables.

II DETAILED EXPLANATION OF CONSTRAINED T/E EMBARKATION ANALYSIS MODEL OUTPUT LISTING

Explanations for the headings, columns, and totals found in the sample output listing from the Constrained T/E Embarkation Analysis Model (CONTEAM), Table C-1, are given below. The number of each explanation relates to the same number superimposed on the output listing of unit M1038.

(1) Unit description.

(2) Total cube of all cube loaded items in unit's T/E.

(3) Percentage of total cube this unit is to be constrained. Total cubic feet of unit when constrained.

(4) Total square of all square loaded items in unit's T/E.

(5) Percentage of total square this unit is to be constrained. Total square feet of unit when constrained.

(6) TAM number from unit's authorized T/E.

(7) Square of individual TAM item.

(8) Cube of individual TAM item.

(9) Weight of individual TAM item.

(10) Item square (column 7) multiplied by T/E quantity (column 13). Total square feet in unit's T/E occupied by all units of a TAM item.

(11) Item cube (column 8) multiplied by T/E quantity (column 13). Total cube feet in unit's T/E occupied by all units of a TAM item.

(12) Item weight (column 9) multiplied by T/E quantity (column 13). Total weight in unit's T/E occupied by all units of a TAM item

(13) Quantity of each TAM item authorized in unit's T/E.

(14) Item criticality. Relevance of item to supporting unit's mission. The 8 criticality items support the unit's primary mission(s); the 4 criticality items support the unit's secondary mission(s); the 2 criticality items support the unit's tertiary mission(s); and the 1 criticality items are the remaining items of the unit's T/E.

(15) Quantity of each TAM item in unit's reduced T/E after applying constraint.

(16) Item square (column 7) multiplied by reduced T/E quantity (column 15). Total square in unit's constrained T/E occupied by all units of a TAM item.

(17) Item cube (column 8) multiplied by reduced T/E quantity (column 15). Total cube in unit's constrained T/E occupied by all units of a TAM item.

(18) Item deficiency in constrained T/E (column 13- column 15).

(19) Total square feet of all square loaded TAM items in unit's authorized T/E.

(20) Total cubic feet of all cube loaded TAM items in unit's authorized T/E.

(21) Total weight of all (cube loaded and square loaded) TAM items in unit's authorized T/E.

(22) Total of all units of all TAM items in unit's authorized T/E.

(23) Total of all unit's of all TAM item's in unit's constrained T/E.

(24) Total square feet of all square loaded TAM items in unit's constrained T/E.

(25) Total cubic feet of all cube loaded TAM items in unit's constrained T/E.

(26) Operational Readiness Index relating to unit's constrained T/E square loaded items. This index relates the criticality-weighted square loaded items in the unit's constrained T/E to the criticality-weighted square loaded items in the unit's authorized T/E.

(27) Same as 26 but for cube loaded items.

(28) Same as 26 but for both square loaded and cube loaded items.

III SAMPLE OF FMF T/Es CONSTRAINED TO 95%, 85% AND 75% OF AUTHORIZED ALLOWANCES

Table C-1 contains constrained T/Es for ten representative FMF units. Applied to each unit is a weighted constraint of 90, 85, and 75 percent of the unit's authorized T/E cube and square. Section VI explained how each unit was assigned a weight according to its importance in the assault echelon.

These ten units were chosen as a sample of FMF units since publishing a compendium of all MAF units was too voluminous to include in this appendix.

Table C-1

SAMPLE FMF T/Es CONSTRAINED TO 90%, 85%, AND 75% OF AUTHORIZED T/E ALLOWANCES

CONSTRAINED T/E FOR UNIT M1038

(1) INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

(2) CUBE OF PUBLISHED T/E IS 16656.65 CU FT
(3) CONSTRAINED TO 95.0 PCT OR 15824.00 CU FT

(4) SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
(5) CONSTRAINED TO 95.0 PCT OR 4209.00 SQ FT

(6) TAM	(7) ITEM SQUARE	(8) ITEM CUBE	(9) ITEM WEIGHT	(10) T/E SQUARE	(11) T/E CUBE	(12) T/E WEIGHT	(13) T/E QTY	(14) CRIT	(15) *****REDUCED T/E**** QTY	(16) SQUARE	(17) CUBE	(18) DEFICIENCY
A0005		5.0	159.0		5.0	159.0	1	8	1.		5.0	
A0030		3.0	47.0		39.0	611.0	13	8	13.		39.0	
A0265		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A0320		1.0	20.0		12.0	240.0	12	8	12.		12.0	
A0328		1.0	9.0		4.0	36.0	4	8	4.		4.0	
A0490		1.0	12.0		25.0	300.0	25	8	25.		25.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0952		1.0	3.0		15.0	45.0	15	8	15.		15.0	
A1190		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		2.0	20.0	2	4	2.		2.0	
A1420		11.0	93.0		22.0	186.0	2	4	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	8	15.		15.0	
A1800		1.0	56.0		7.0	392.0	7	8	7.		7.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	122.0		5070.0	2	8	2.	122.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A1950		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		58.0	1160.0	58	8	58.		58.0	
A2182	60.0		3370.0	120.0		6740.0	2	8	2.	120.0		
A2184		2.0	55.0		4.0	110.0	2	8	2.		4.0	
A2390		1.0	5.0		10.0	50.0	10	8	10.		10.0	
A2480		1.0	28.0		5.0	140.0	5	8	5.		5.0	
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
A2580		1.0	97.0		3.0	291.0	3	8	3.		3.0	
A2660		5.0	90.0		5.0	90.0	1	8	1.		5.0	
A2685		1.0	10.0		4.0	40.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		2.0	50.0	2	4	2.		2.0	
A2900		2.0	30.0		2.0	30.0	1	4	1.		2.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0490		29.0	312.0		29.0	312.0	1	4	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	2	1.		8.1	
B1540		1.0	116.0		2.0	232.0	2	2	2.		2.0	
B1650		13.0	355.0		26.0	710.0	2	2	2.		26.0	
B1690		173.0	960.0		346.0	1920.0	2	2	2.		346.0	
B2220		4.2	140.0		4.2	140.0	1	2	1.		4.2	

NOTE:
Unit = M1038
Constraint = 90%

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 95.0 PCT OR 15824.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 95.0 PCT OR 4209.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
C2010		.3	4.0		7.8	100.0	25	1	25.		7.8	
C2030		.5	6.0		12.0	150.0	25	1	25.		12.0	
C2040		.3	3.0		13.5	150.0	50	1	50.		13.5	
C2050		.8	7.0		18.7	175.0	25	1	25.		18.7	
C2060		.0	1.0		.1	5.0	5	1	5.		.1	
C2070		1.9	60.0		18.5	600.0	10	1	10.		18.5	
C2100		.2	3.0		1.0	18.0	6	1	6.		1.0	
C2160		.1	1.0		3.5	50.0	50	1	50.		3.5	
C2230		.0	1.0		.1	5.0	5	1	5.		.1	
C2250		.2	2.0		3.8	50.0	25	1	25.		3.8	
C2310		.7	2.0		17.0	50.0	25	1	25.		17.0	
C3020		1.0	16.0		1236.5	19984.0	1249	1	1249.		1236.5	
C4000		6.3	80.0		75.6	960.0	12	1	12.		75.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		19.6	240.0	6	1	6.		19.6	
C4110		1.1	10.0		51.8	480.0	48	1	48.		51.8	
C4140		.5	10.0		2.9	60.0	6	1	6.		2.9	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4290		11.0	180.0		10120.0	165600.0	920	1	850.		9350.1	70.
C4340		11.0	64.0		55.0	320.0	5	1	5.		55.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		3.9	390.0	390	1	390.		3.9	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		11.7	240.0	6	1	6.		11.7	
C4790		7.7	40.0		84.6	440.0	11	1	11.		84.6	
C4870		6.4	85.0		44.6	595.0	7	1	7.		44.6	
C4880		3.6	8.0		210.0	472.0	59	1	56.		200.8	3.
C4930		.4	12.0		.7	24.0	2	1	2.		.7	
C4950		1.0	60.0		1.0	60.0	1	1	1.		1.0	
C4980		14.0	150.0		490.0	5250.0	35	1	32.		450.2	3.
C5090		4.0	196.0		8.1	392.0	2	1	2.		8.1	
C5110		2.7	14.0		95.8	504.0	36	1	34.		91.6	2.
C5200		3.8	4.0		83.2	88.0	22	1	22.		83.2	
C5320		8.2	162.0		138.7	2754.0	17	1	17.		138.7	
C5400		7.0	150.0		132.2	2850.0	19	1	19.		132.2	
C5410		9.0	131.0		18.0	262.0	2	1	2.		18.0	
C5820		25.0	353.0		600.0	8472.0	24	1	24.		590.5	
C5870		4.3	34.0		25.7	223.0	6	1	6.		25.7	

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 95.0 PCT OR 15824.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 95.0 PCT OR 4209.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C5930		2.8	100.0		22.1	800.0	8	1	9.		22.1	
C5990		1.5	31.0		1.5	31.0	1	1	1.		1.5	
C6010		5.0	200.0		5.0	200.0	1	1	1.		5.0	
C6140		.2	7.0		1.3	49.0	7	1	7.		1.3	
C6215		6.0	84.0		6.0	84.0	1	1	1.		6.0	
C6220		.5	7.0		6.0	84.0	12	1	12.		6.0	
C6260		11.0	5.0		11.0	5.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		86.2	3084.0	12	1	12.		86.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6500		1.0	12.0		5.0	60.0	5	1	5.		5.0	
C6510		6.9	90.0		34.3	450.0	5	1	5.		34.3	
C6650		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		1.1	111.0	111	1	111.		1.1	
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D04[illegible]		.5	16.0		.5	16.0	1	2	1.		.5	
D0[illegible]10		.6	16.0		.6	16.0	1	2	1.		.6	
D05[illegible]0		.3	10.0		.3	10.0	1	2	1.		.3	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	828.0		10260.0	18	8	17.	755.7		1.
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	71.0		
D1020	134.0		7370.0	938.0		51590.0	7	8	7.	938.0		
D1100	18.0		900.0	540.0		27000.0	30	8	27.	490.9		3.
D1160	61.0		2400.0	1220.0		48000.0	20	8	18.	1109.5		2.
E0080		.1	3.0		4.3	108.0	36	1	36.		4.3	
E0090		.4	7.0		1.6	28.0	4	1	4.		1.6	
E0180		1.0	10.0		1.0	10.0	1	8	1.		1.0	
E0210		.0	1.0		.1	5.0	5	1	5.		.1	
E0230		4.0	68.0		4.0	68.0	1	8	1.		4.0	
E0290		.4	7.0		4.8	84.0	12	4	12.		4.8	
E0320		8.9	108.0		17.9	216.0	2	8	2.		17.9	
E0892		0.0	0.0		0.0	0.0	110	8	110.		0.0	
E0900		3.0	27.0		36.0	324.0	12	8	12.		36.0	
E0920		2.2	15.0		68.3	480.0	32	8	32.		68.3	
E0990		1.3	24.0		45.5	840.0	35	8	35.		45.5	
E1060		12.0	50.0		144.0	600.0	12	8	12.		144.0	

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 95.0 PCT OR 15824.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 95.0 PCT OR 4209.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E**** CUBE	DEFIC-IENCY
E1090		62.0	120.0		496.0	960.0	8	8	8.		496.0	
E1155		0.0	0.0		0.0	0.0	36	8	36.		0.0	
E1156		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1157		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1180		.0	2.0		1.1	72.0	36	8	36.		1.1	
E1240		.0	1.0		.6	20.0	20	8	20.		.6	
E1260		1.0	3.0		2.0	6.0	2	1	2.		2.0	
E1480	45.0		420.0	360.0		3360.0	8	8	8.	360.0		
E1530		4.2	68.0		4.2	68.0	1	8	1.		4.2	
E1760		.3	8.0		1.3	32.0	4	8	4.		1.3	
E1900		1.0	5.0		2.0	10.0	2	4	2.		2.0	
E1950		.1	2.0		.1	2.0	1	2	1.		.1	
E2030		1.1	39.0		3.4	117.0	3	2	3.		3.4	
GRAND TOTALS				4431.0	16656.6	412462.0	4051		3968.	4209.0	15824.0	
				19	20	21	22		23	24	25	

TODAYS DATE 03/03/76
26 OR INDEX(SQUARE) = 93.46
27 OR INDEX(CUBE) = 98.99
28 OR INDEX(TOTAL T/E) = 98.51

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 92.5 PCT OR 15407.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 4099.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0005		5.0	159.0		5.0	159.0	1	8	1.		5.0	
A0090		3.0	47.0		39.0	611.0	13	8	13.		39.0	
A0265		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A0320		1.0	20.0		12.0	240.0	12	8	12.		12.0	
A0328		1.0	9.0		4.0	36.0	4	8	4.		4.0	
A0490		1.0	12.0		25.0	300.0	25	8	25.		25.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0922		1.0	3.0		15.0	45.0	15	8	15.		15.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		2.0	20.0	2	4	2.		2.0	
A1420		11.0	93.0		22.0	186.0	2	4	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	8	15.		15.0	
A1800		1.0	56.0		7.0	392.0	7	8	7.		7.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	122.0		5070.0	2	8	2.	122.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A1950		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		58.0	1160.0	58	8	58.		58.0	
A2132	60.0		3370.0	120.0		6740.0	2	8	2.	120.0		
A2184		2.0	55.0		4.0	110.0	2	8	2.		4.0	
A2390		1.0	5.0		10.0	50.0	10	8	10.		10.0	
A2480		1.0	28.0		5.0	140.0	5	8	5.		5.0	
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
A2580		1.0	97.0		3.0	291.0	3	8	3.		3.0	
A2660		5.0	90.0		5.0	90.0	1	8	1.		5.0	
A2685		1.0	10.0		4.0	40.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		2.0	50.0	2	4	2.		2.0	
A2900		2.0	30.0		2.0	30.0	1	4	1.		2.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0490		29.0	312.0		29.0	312.0	1	4	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	2	1.		8.1	
B1540		1.0	116.0		2.0	232.0	2	2	2.		2.0	
B1550		13.0	355.0		26.0	710.0	2	2	2.		26.0	
B1690		173.0	960.0		346.0	1920.0	2	2	2.		346.0	
B2220		4.2	140.0		4.2	140.0	1	2	1.		4.2	

NOTE:

Unit = M1038
Constraint = 85%

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 92.5 PCT OR 15407.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 4099.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C2010		.3	4.0		7.8	100.0	25	1	25.		7.8	
C2030		.5	6.0		12.0	150.0	25	1	25.		12.0	
C2040		.3	3.0		13.5	150.0	50	1	50.		13.5	
C2050		.8	7.0		18.7	175.0	25	1	25.		18.7	
C2060		.0	1.0		.1	5.0	5	1	5.		.1	
C2070		1.9	60.0		18.5	600.0	10	1	10.		18.5	
C2100		.2	3.0		1.0	18.0	6	1	6.		1.0	
C2160		.1	1.0		3.5	50.0	50	1	50.		3.5	
C2230		.0	1.0		.1	5.0	5	1	5.		.1	
C2250		.2	2.0		3.8	50.0	25	1	25.		3.8	
C2310		.7	2.0		17.0	50.0	25	1	25.		17.0	
C3020		1.0	16.0		1236.5	19984.0	1249	1	1249.		1236.5	
C4000		6.3	80.0		75.6	960.0	12	1	12.		75.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		19.6	240.0	6	1	6.		19.6	
C4110		1.1	10.0		51.8	480.0	48	1	48.		51.8	
C4140		.5	10.0		2.9	60.0	6	1	6.		2.9	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4290		11.0	180.0		10120.0	165600.0	920	1	815.		8964.5	105.
C4340		11.0	64.0		55.0	320.0	5	1	5.		55.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		3.9	390.0	390	1	390.		3.9	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		11.7	240.0	6	1	6.		11.7	
C4790		7.7	40.0		84.6	440.0	11	1	11.		84.6	
C4870		6.4	85.0		44.6	595.0	7	1	7.		44.6	
C4880		3.6	8.0		210.0	472.0	59	1	55.		196.2	4.
C4930		.4	12.0		.7	24.0	2	1	2.		.7	
C4950		1.0	60.0		1.0	60.0	1	1	1.		1.0	
C4980		14.0	150.0		490.0	5250.0	35	1	31.		430.3	4.
C5090		4.0	196.0		8.1	392.0	2	1	2.		8.1	
C5110		2.7	14.0		95.8	504.0	36	1	34.		89.4	2.
C5200		3.8	4.0		83.2	88.0	22	1	22.		83.2	
C5320		8.2	162.0		138.7	2754.0	17	1	17.		138.7	
C5400		7.0	150.0		132.2	2850.0	19	1	19.		132.2	
C5410		9.0	131.0		18.0	262.0	2	1	2.		18.0	
C5820		25.0	353.0		600.0	8472.0	24	1	23.		585.7	1.
C5870		4.3	38.0		25.7	228.0	6	1	6.		25.7	

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 92.5 PCT OR 15407.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 4099.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5990		1.5	31.0		1.5	31.0	1	1	1.		1.5	
C6010		5.0	200.0		5.0	200.0	1	1	1.		5.0	
C6140		.2	7.0		1.3	49.0	7	1	7.		1.3	
C6215		6.0	84.0		6.0	84.0	1	1	1.		6.0	
C6220		.5	7.0		6.0	84.0	12	1	12.		6.0	
C6260		11.0	5.0		11.0	5.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		86.2	3084.0	12	1	12.		86.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6500		1.0	12.0		5.0	60.0	5	1	5.		5.0	
C6510		6.9	90.0		34.3	450.0	5	1	5.		34.3	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		1.1	111.0	111	1	111.		1.1	
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0530		.3	10.0		.3	10.0	1	2	1.		.3	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	828.0		10260.0	18	8	16.	738.1		2.
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	71.0		
D1020	134.0		7370.0	938.0		51590.0	7	8	7.	928.6		
D1100	18.0		900.0	540.0		27000.0	30	8	26.	464.1		4.
D1160	61.0		2400.0	1220.0		48000.0	20	8	18.	1068.7		2.
E0080		.1	3.0		4.3	108.0	36	1	36.		4.3	
E0090		.4	7.0		1.6	28.0	4	1	4.		1.6	
E0180		1.0	10.0		1.0	10.0	1	8	1.		1.0	
E0210		.0	1.0		.1	5.0	5	1	5.		.1	
E0230		4.0	68.0		4.0	68.0	1	8	1.		4.0	
E0290		.4	7.0		4.8	84.0	12	4	12.		4.8	
E0320		8.9	108.0		17.9	216.0	2	8	2.		17.9	
E0892		0.0	0.0		0.0	0.0	110	8	110.		0.0	
E0900		3.0	27.0		36.0	324.0	12	8	12.		36.0	
E0920		2.2	15.0		68.8	480.0	32	8	32.		68.8	
E0990		1.3	24.0		45.5	840.0	35	8	35.		45.5	
E1060		12.0	50.0		144.0	600.0	12	8	12.		144.0	

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 92.5 PCT OR 15407.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 4099.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFFIC-IENCY
E1090		62.0	120.0		496.0	960.0	8	8	8.		496.0	
E1155		0.0	0.0		0.0	0.0	36	8	36.		0.0	
E1156		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1157		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1180		.0	2.0		1.1	72.0	36	8	36.		1.1	
E1240		.0	1.0		.6	20.0	20	8	20.		.6	
E1260		1.0	3.0		2.0	6.0	2	1	2.		2.0	
E1480	45.0		420.0	360.0		3360.0	8	8	8.	354.5		
E1530		4.2	68.0		4.2	68.0	1	8	1.		4.2	
E1760		.3	8.0		1.3	32.0	4	8	4.		1.3	
E1900		1.0	5.0		2.0	10.0	2	4	2.		2.0	
E1960		.1	2.0		.1	2.0	1	2	1.		.1	
E2030		1.1	39.0		3.4	117.0	3	2	3.		3.4	
GRAND TOTALS				4431.0	16656.6	412462.0	4051		3926.	4099.0	15407.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 90.20
OR INDEX(CUBE) = 98.48
OR INDEX(TOTAL T/E) = 97.76

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 67.5 PCT OR 14575.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 3877.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
A0005		5.0	159.0		5.0	159.0	1	8	1.		5.0	
A0090		3.0	47.0		39.0	611.0	13	8	13.		39.0	
A0265		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A0320		1.0	20.0		12.0	240.0	12	8	12.		12.0	
A0328		1.0	9.0		4.0	36.0	4	8	4.		4.0	
A0490		1.0	12.0		25.0	300.0	25	8	25.		25.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0922		1.0	3.0		15.0	45.0	15	8	15.		15.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		2.0	20.0	2	4	2.		2.0	
A1420		11.0	93.0		22.0	186.0	2	4	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	8	15.		15.0	
A1800		1.0	56.0		7.0	392.0	7	8	7.		7.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	122.0		5070.0	2	8	2.	122.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A1950		0.0	0.0		0.0	0.0	1	8	1.		0.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		58.0	1160.0	58	8	58.		58.0	
A2182	60.0		3370.0	120.0		6740.0	2	8	2.	120.0		
A2184		2.0	55.0		4.0	110.0	2	8	2.		4.0	
A2390		1.0	5.0		10.0	50.0	10	8	10.		10.0	
A2480		1.0	28.0		5.0	140.0	5	8	5.		5.0	
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
A2580		1.0	97.0		3.0	291.0	3	8	3.		3.0	
A2660		5.0	90.0		5.0	90.0	1	8	1.		5.0	
A2685		1.0	10.0		4.0	40.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		2.0	50.0	2	4	2.		2.0	
A2900		2.0	30.0		2.0	30.0	1	4	1.		2.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	49.4		
B0430		29.0	312.0		29.0	312.0	1	4	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	2	1.		8.1	
B1540		1.0	116.0		2.0	232.0	2	2	2.		2.0	
B1650		13.0	355.0		26.0	710.0	2	2	2.		26.0	
B1690		173.0	960.0		346.0	1920.0	2	2	2.		346.0	
B2220		4.2	140.0		4.2	140.0	1	2	1.		4.2	

NOTE:

Unit = M1038

Constraint = 75%

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 87.5 PCT OR 14575.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 3977.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C2010		.3	4.0		7.8	100.0	25	1	25.		7.8	
C2030		.5	6.0		12.0	150.0	25	1	25.		12.0	
C2040		.3	3.0		13.5	150.0	50	1	50.		13.5	
C2050		.8	7.0		18.7	175.0	25	1	25.		18.7	
C2060		.0	1.0		.1	5.0	5	1	5.		.1	
C2070		1.9	60.0		18.5	600.0	10	1	10.		18.5	
C2100		.2	3.0		1.0	18.0	6	1	6.		1.0	
C2160		.1	1.0		3.5	50.0	50	1	50.		3.5	
C2230		.0	1.0		.1	5.0	5	1	5.		.1	
C2250		.2	2.0		3.8	50.0	25	1	25.		3.8	
C2310		.7	2.0		17.0	50.0	25	1	25.		17.0	
C3020		1.0	16.0		1236.5	19984.0	1249	1	1155.		1143.3	94.
C4000		6.3	80.0		75.6	960.0	12	1	12.		75.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		19.6	240.0	6	1	6.		19.6	
C4110		1.1	10.0		51.8	480.0	48	1	44.		47.9	4.
C4140		.5	10.0		2.9	60.0	6	1	6.		2.9	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4290		11.0	180.0		10120.0	165600.0	920	1	756.		8320.3	164.
C4340		11.0	64.0		55.0	320.0	5	1	5.		55.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		3.9	390.0	390	1	390.		3.9	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		11.7	240.0	6	1	6.		11.7	
C4790		7.7	40.0		84.6	440.0	11	1	11.		84.6	
C4870		6.4	85.0		44.6	595.0	7	1	7.		44.6	
C4880		3.6	8.0		210.0	472.0	59	1	52.		183.5	7.
C4930		.4	12.0		.7	24.0	2	1	2.		.7	
C4950		1.0	60.0		1.0	60.0	1	1	1.		1.0	
C4980		14.0	150.0		490.0	5250.0	35	1	28.		397.5	7.
C5090		4.0	196.0		8.1	392.0	2	1	2.		8.1	
C5110		2.7	14.0		95.8	504.0	36	1	32.		84.8	4.
C5200		3.8	4.0		83.2	88.0	22	1	22.		83.2	
C5320		8.2	162.0		138.7	2754.0	17	1	17.		138.7	
C5400		7.0	150.0		132.2	2850.0	19	1	19.		132.2	
C5410		9.0	131.0		18.0	262.0	2	1	2.		18.0	
C5920		25.0	353.0		600.0	8472.0	24	1	22.		545.1	2.
C5870		4.3	38.0		25.7	228.0	6	1	6.		25.7	

CONSTRAINED T/E FOR UNIT M1039

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 87.5 PCT OR 14575.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 3877.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5990		1.5	31.0		1.5	31.0	1	1	1.		1.5	
C6010		5.0	200.0		5.0	200.0	1	1	1.		5.0	
C6140		.2	7.0		1.3	49.0	7	1	7.		1.3	
C6215		6.0	84.0		6.0	84.0	1	1	1.		6.0	
C6220		.5	7.0		6.0	84.0	12	1	12.		6.0	
C6260		11.0	5.0		11.0	5.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	855.0	8	1	8.		50.4	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		86.2	3084.0	12	1	12.		86.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6500		1.0	12.0		5.0	60.0	5	1	5.		5.0	
C6510		6.9	90.0		34.3	450.0	5	1	5.		34.3	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		1.1	111.0	111	1	111.		1.1	
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0530		.3	10.0		.3	10.0	1	2	1.		.3	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	828.0		10260.0	18	8	15.	696.2		3.
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	70.3		
D1020	134.0		7370.0	938.0		51590.0	7	8	6.	860.9		1.
D1100	18.0		900.0	540.0		27000.0	30	8	25.	441.7		5.
D1150	61.0		2400.0	1220.0		48000.0	20	8	17.	1006.8		3.
E0080		.1	3.0		4.3	108.0	36	1	36.		4.3	
E0090		.4	7.0		1.5	28.0	4	1	4.		1.6	
E0180		1.0	10.0		1.0	10.0	1	8	1.		1.0	
E0210		.0	1.0		.1	5.0	5	1	5.		.1	
E0230		4.0	68.0		4.0	68.0	1	8	1.		4.0	
E0290		.4	7.0		4.8	84.0	12	4	12.		4.8	
E0320		8.9	108.0		17.9	216.0	2	8	2.		17.9	
E0892		0.0	0.0		0.0	0.0	110	8	110.		0.0	
E0900		3.0	27.0		36.0	324.0	12	8	12.		36.0	
E0920		2.2	15.0		68.3	480.0	32	8	32.		68.8	
E0990		1.3	24.0		45.5	840.0	35	8	35.		45.5	
E1060		12.0	50.0		144.0	600.0	12	8	12.		144.0	

CONSTRAINED T/E FOR UNIT M1038

INFANTRY BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 16656.65 CU FT
CONSTRAINED TO 87.5 PCT OR 14575.00 CU FT

SQUARE OF PUBLISHED T/E IS 4431.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 3877.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E***** SQUARE	CUBE	DEFIC-IENCY
E1090		62.0	120.0		496.0	960.0	8	8	8.		496.0	
E1155		0.0	0.0		0.0	0.0	36	8	36.		0.0	
E1156		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1157		0.0	0.0		0.0	0.0	4	8	4.		0.0	
E1180		.0	2.0		1.1	72.0	36	8	36.		1.1	
E1240		.0	1.0		.6	20.0	20	8	20.		.6	
E1260		1.0	3.0		2.0	6.0	2	1	2.		2.0	
E1480	45.0		420.0	360.0		3360.0	8	8	7.	331.7		1.
E1530		4.2	68.0		4.2	68.0	1	8	1.		4.2	
E1760		.3	8.0		1.3	32.0	4	8	4.		1.3	
E1900		1.0	5.0		2.0	10.0	2	4	2.		2.0	
E1960		.1	2.0		.1	2.0	1	2	1.		.1	
E2030		1.1	39.0		3.4	117.0	3	2	3.		3.4	
GRAND TOTALS				4431.0	16656.6	412462.0	4051		3756.	3877.0	14575.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 85.54
OR INDEX(CUBE) = 96.31
OR INDEX(TOTAL T/E) = 95.38

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.34 CU FT
CONSTRAINED TO 90.0 PCT OR 5141.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 24242.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFIC-IENCY
A0090		3.0	47.0		12.0	188.0	4	4	4.		12.0	
A0320		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A0490		1.0	12.0		4.0	48.0	4	2	4.		4.0	
A0710		1.0	42.0		1.0	42.0	1	2	1.		1.0	
A0922		1.0	3.0		3.0	9.0	3	2	3.		3.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1570		1.0	45.0		1.0	45.0	1	2	1.		1.0	
A1730		1.0	22.0		6.0	132.0	6	4	6.		6.0	
A1800		1.0	56.0		5.0	280.0	5	4	5.		5.0	
A1900	70.0		4190.0	70.0		4190.0	1	4	1.	70.0		
A1920	61.0		2535.0	122.0		5070.0	2	4	2.	122.0		
A1930	60.0		2670.0	180.0		8010.0	3	4	3.	180.0		
A1940		350.0	2575.0		350.0	2575.0	1	4	1.		350.0	
A2020		8.0	139.0		8.0	139.0	1	4	1.		8.0	
A2050		1.0	20.0		6.0	120.0	6	4	6.		6.0	
A2480		1.0	28.0		2.0	56.0	2	4	2.		2.0	
A2700		1.0	20.0		1.0	20.0	1	2	1.		1.0	
A2710		1.0	25.0		1.0	25.0	1	2	1.		1.0	
A3280		1.0	15.0		1.0	15.0	1	2	1.		1.0	
B0465	54.0		2641.0	54.0		2641.0	1	4	1.	54.0		
B1290		55.0	1750.0		55.0	1750.0	1	1	1.		55.0	
B1620		10.0	220.0		40.0	880.0	4	2	4.		40.0	
B2220		4.2	140.0		17.0	560.0	4	2	4.		17.0	
C2010		.3	4.0		6.2	80.0	20	1	20.		6.2	
C2030		.5	6.0		9.6	120.0	20	1	20.		9.6	
C2040		.3	3.0		10.8	120.0	40	1	33.		8.8	7.
C2050		.8	7.0		15.0	140.0	20	1	20.		15.0	
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.8	15.0	5	1	5.		.8	
C2160		.1	1.0		2.8	40.0	40	1	36.		2.5	4.
C2230		.0	1.0		.0	4.0	4	1	4.		.0	
C2250		.2	2.0		3.0	40.0	20	1	20.		3.0	
C2310		.7	2.0		13.6	40.0	20	1	20.		13.6	
C3020		1.0	16.0		271.3	4384.0	274	1	203.		200.6	71.
C4000		6.3	80.0		25.2	320.0	4	1	4.		25.2	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.3	20.0	4	1	4.		.3	
C4040		3.3	40.0		16.3	200.0	5	1	5.		16.3	
C4140		.5	10.0		2.0	40.0	4	1	4.		2.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		44.0	256.0	4	1	4.		44.0	

NOTE:

Unit = M1658
Constraint = 90%

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.38 CU FT
CONSTRAINED TO 90.0 PCT OR 5141.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 24242.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4390		7.7	60.0		23.0	180.0	3	1	3.		23.0	
C4436		.0	1.0		1.5	151.0	151	1	151.		1.5	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		9.8	200.0	5	1	5.		9.8	
C4790		7.7	40.0		38.4	200.0	5	1	5.		38.4	
C4820		15.0	150.0		30.0	300.0	2	1	2.		30.0	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C4880		3.6	8.0		53.4	120.0	15	1	15.		53.4	
C4930		.4	12.0		1.4	48.0	4	1	4.		1.4	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C4980		14.0	150.0		224.0	2400.0	16	1	15.		215.8	1.
C5020		15.0	250.0		45.0	750.0	3	1	3.		45.0	
C5090		4.0	196.0		4.0	196.0	1	1	1.		4.0	
C5110		2.7	14.0		18.6	98.0	7	1	7.		18.6	
C5200		3.8	4.0		41.6	44.0	11	1	11.		41.6	
C5320		8.2	162.0		81.6	1620.0	10	1	10.		81.6	
C5400		7.0	150.0		90.5	1950.0	13	1	13.		90.5	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		200.0	2824.0	8	1	8.		200.0	
C5870		4.3	39.0		34.2	304.0	8	1	8.		34.2	
C5930		2.8	100.0		13.8	500.0	5	1	5.		13.8	
C5990		1.5	31.0		5.8	124.0	4	1	4.		5.8	
C6140		.2	7.0		1.1	42.0	6	1	6.		1.1	
C6220		.5	5.0		2.0	20.0	4	1	4.		2.0	
C6250		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6370		6.3	107.0		25.2	428.0	4	1	4.		25.2	
C6388		5.9	140.0		88.0	2100.0	15	1	15.		88.0	
C6390		7.2	257.0		35.9	1285.0	5	1	5.		35.9	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		476.0	8592.0	4	1	4.		476.0	
C6490		1.5	62.0		42.0	1736.0	28	1	20.		29.9	8.
C6510		6.9	90.0		27.5	360.0	4	1	4.		27.5	
C6650		50.0	300.0		150.0	900.0	3	1	3.		150.0	
C6670		.9	19.0		.9	19.0	1	1	1.		.9	
C6684		.0	1.0		.4	37.0	37	1	37.		.4	
00070		1.4	28.0		1.4	28.0	1	4	1.		1.4	
00090	38.0		1054.0	114.0		3162.0	3	4	3.	114.0		
00170		4.0	517.0		72.0	9306.0	18	1	18.		72.0	
00190	119.0		5855.0	357.0		17565.0	3	4	3.	357.0		
00310		1.4	21.0		5.5	[illegible]	4	4	4.		5.5	

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.33 CU FT
CONSTRAINED TO 90.0 PCT OR 5141.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 24242.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E***** QTY	SQUARE	CUBE	DEFIC-IENCY
D0400		.5	16.0		2.1	64.0	4	4	4.		2.1	
D0410		.6	16.0		2.5	64.0	4	4	4.		2.5	
D0420		.7	11.0		5.0	77.0	7	4	7.		5.0	
D0725		125.0	1832.0		875.0	12824.0	7	4	7.		875.0	
D0740		35.8	710.0		465.4	9230.0	13	4	13.		465.4	
D0750		.3	8.0		1.0	24.0	3	4	3.		1.0	
D0770		90.7	1890.0		362.8	7560.0	4	4	4.		362.8	
D0840	46.0		570.0	598.0		7410.0	13	4	10.	458.9		3.
D0860	96.0		2750.0	5760.0		165000.0	60	4	50.	4842.1		10.
D0880	93.0		2710.0	465.0		13550.0	5	4	5.	424.3		
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1030	176.0		13660.0	16896.0		1311360.0	96	8	89.	15585.5		7.
D1110	185.0		14970.0	555.0		44910.0	3	9	3.	555.0		
D1160	61.0		2400.0	976.0		38400.0	16	4	12.	713.3		4.
D1210	239.0		34250.0	717.0		102750.0	3	4	3.	694.8		
D1250		.0	2.0		.1	8.0	4	1	4.		.1	
E0080		.1	3.0		2.3	57.0	19	1	19.		2.3	
E0980		3.0	89.0		91.8	2759.0	31	2	22.		65.4	9.
E0990		1.3	24.0		18.2	336.0	14	4	14.		18.2	
E1120		.5	12.0		6.7	168.0	14	1	14.		6.7	
E1150		28.0	530.0		840.0	15900.0	30	1	14.		388.2	16.
E1155		0.0	0.0		0.0	0.0	4	2	4.		0.0	
E1156		0.0	0.0		0.0	0.0	2	2	2.		0.0	
E2030		1.1	39.0		1.1	39.0	1	4	1.		1.1	
GRAND TOTALS				26935.0	5712.4	1830193.0	1346		1205.	24242.0	5141.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 89.53
OR INDEX(CUBE) = 91.42
OR INDEX(TOTAL T/E) = 90.55

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.38 CU FT
CONSTRAINED TO 85.0 PCT OR 4856.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 22895.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E***** QTY	SQUARE	CUBE	DEFIC-IENCY
A0090		3.0	47.0		12.0	188.0	4	4	4.		12.0	
A0320		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A0430		1.0	12.0		4.0	48.0	4	2	4.		4.0	
A0710		1.0	42.0		1.0	42.0	1	2	1.		1.0	
A0922		1.0	3.0		3.0	9.0	3	2	3.		3.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1570		1.0	45.0		1.0	45.0	1	2	1.		1.0	
A1730		1.0	22.0		6.0	132.0	6	4	6.		6.0	
A1800		1.0	56.0		5.0	280.0	5	4	5.		5.0	
A1900	70.0		4190.0	70.0		4190.0	1	4	1.	70.0		
A1920	61.0		2535.0	122.0		5070.0	2	4	2.	122.0		
A1930	60.0		2670.0	180.0		8010.0	3	4	3.	177.3		
A1940		350.0	2575.0		350.0	2575.0	1	4	1.		350.0	
A2020		8.0	139.0		8.0	139.0	1	4	1.		8.0	
A2050		1.0	20.0		6.0	120.0	6	4	6.		6.0	
A2480		1.0	28.0		2.0	56.0	2	4	2.		2.0	
A2700		1.0	20.0		1.0	20.0	1	2	1.		1.0	
A2710		1.0	25.0		1.0	25.0	1	2	1.		1.0	
A3280		1.0	15.0		1.0	15.0	1	2	1.		1.0	
B0465	54.0		2641.0	54.0		2641.0	1	4	1.	54.0		
B1280		55.0	1750.0		55.0	1750.0	1	1	1.		55.0	
B1620		10.0	220.0		40.0	880.0	4	2	4.		40.0	
B2220		4.2	140.0		17.0	560.0	4	2	4.		17.0	
C2010		.3	4.0		6.2	80.0	20	1	20.		6.2	
C2030		.5	6.0		9.6	120.0	20	1	20.		9.6	
C2040		.3	3.0		10.8	120.0	40	1	33.		8.9	7.
C2050		.8	7.0		15.0	140.0	20	1	20.		15.0	
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.8	15.0	5	1	5.		.8	
C2160		.1	1.0		2.8	40.0	40	1	36.		2.5	4.
C2230		.0	1.0		.0	4.0	4	1	4.		.0	
C2250		.2	2.0		3.0	40.0	20	1	20.		3.0	
C2310		.7	2.0		13.6	40.0	20	1	20.		13.6	
C3020		1.0	16.0		271.3	4384.0	274	1	205.		203.7	69.
C4000		6.3	80.0		25.2	320.0	4	1	4.		25.2	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.3	20.0	4	1	4.		.3	
C4040		3.3	40.0		16.3	200.0	5	1	5.		16.3	
C4140		.5	10.0		2.0	40.0	4	1	4.		2.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		44.0	256.0	4	1	4.		44.0	

NOTE:

Unit = M1658
Constraint = 85%

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.38 CU FT
CONSTRAINED TO 85.0 PCT OR 4856.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 22895.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4390		7.7	60.0		23.0	180.0	3	1	3.		23.0	
C4436		.0	1.0		1.5	151.0	151	1	151.		1.5	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		9.8	200.0	5	1	5.		9.8	
C4790		7.7	40.0		38.4	200.0	5	1	5.		38.4	
C4820		15.0	150.0		30.0	300.0	2	1	2.		30.0	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C4880		3.6	8.0		53.4	120.0	15	1	15.		53.4	
C4930		.4	12.0		1.4	48.0	4	1	4.		1.4	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C4980		14.0	150.0		224.0	2400.0	16	1	14.		199.9	2.
C5030		15.0	250.0		45.0	750.0	3	1	3.		45.0	
C5090		4.0	196.0		4.0	196.0	1	1	1.		4.0	
C5110		2.7	14.0		18.6	98.0	7	1	7.		18.6	
C5200		3.8	4.0		41.6	44.0	11	1	11.		41.6	
C5320		8.2	162.0		81.6	1620.0	10	1	10.		81.6	
C5400		7.0	150.0		90.5	1950.0	13	1	13.		90.5	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		200.0	2824.0	8	1	8.		200.0	
C5870		4.3	38.0		34.2	304.0	8	1	8.		34.2	
C5930		2.8	100.0		13.8	500.0	5	1	5.		13.8	
C5990		1.5	31.0		5.8	124.0	4	1	4.		5.8	
C6140		.2	7.0		1.1	42.0	6	1	6.		1.1	
C6220		.5	5.0		2.0	20.0	4	1	4.		2.0	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6370		6.3	107.0		25.2	428.0	4	1	4.		25.2	
C6388		5.9	140.0		88.0	2100.0	15	1	15.		88.0	
C6390		7.2	257.0		35.9	1285.0	5	1	5.		35.9	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		476.0	8592.0	4	1	2.		179.3	2.
C6490		1.5	62.0		42.0	1736.0	28	1	20.		30.5	8.
C6510		6.9	90.0		27.5	360.0	4	1	4.		27.5	
C6650		50.0	300.0		150.0	900.0	3	1	3.		150.0	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		.4	37.0	37	1	37.		.4	
D0070		1.4	28.0		1.4	28.0	1	4	1.		1.4	
D0090	38.0		1054.0	114.0		3162.0	3	4	3.	114.0		
D0170		4.0	517.0		72.0	9306.0	18	1	18.		70.6	
D0190	119.0		5855.0	357.0		17565.0	3	4	3.	333.9		
D0390		1.4	21.0		5.5	84.0	4	4	4.		5.5	

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.38 CU FT
CONSTRAINED TO 85.0 PCT OR 4856.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 22895.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E**** CUBE	DEFIC-IENCY
00400		.5	16.0		2.1	64.0	4	4	4.		2.1	
00410		.6	16.0		2.5	64.0	4	4	4.		2.5	
00420		.7	11.0		5.0	77.0	7	4	7.		5.0	
00725		125.0	1832.0		875.0	12824.0	7	4	7.		875.0	
00740		35.8	710.0		465.4	9230.0	13	4	13.		465.4	
00750		.3	8.0		1.0	24.0	3	4	3.		1.0	
00770		90.7	1890.0		362.8	7560.0	4	4	4.		362.8	
00840	46.0		570.0	598.0		7410.0	13	4	9.	420.1		4.
00860	96.0		2750.0	5760.0		165000.0	60	4	46.	4395.5		14.
00880	93.0		2710.0	465.0		13550.0	5	4	4.	392.3		1.
00890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
01030	176.0		13660.0	16896.0		1311360.0	96	8	85.	14920.9		11.
01110	185.0		14970.0	555.0		44910.0	3	8	3.	555.0		
01160	61.0		2400.0	976.0		38400.0	16	4	11.	647.2		5.
01210	239.0		34250.0	717.0		102750.0	3	4	3.	631.8		
01250		.0	2.0		.1	8.0	4	1	4.		.1	
E0080		.1	3.0		2.3	57.0	19	1	19.		2.3	
E0980		3.0	89.0		91.8	2759.0	31	2	23.		66.7	9.
E0990		1.3	24.0		18.2	336.0	14	4	14.		18.2	
E1120		.5	12.0		6.7	168.0	14	1	14.		6.7	
E1150		28.0	530.0		840.0	15900.0	30	1	15.		412.2	15.
E1155		0.0	0.0		0.0	0.0	4	2	4.		0.0	
E1156		0.0	0.0		0.0	0.0	2	2	2.		0.0	
E2030		1.1	39.0		1.1	39.0	1	4	1.		1.1	
GRAND TOTALS				26935.0	5712.4	1830193.0	1346		1194.	22895.0	4856.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 84.64
OR INDEX(CUBE) = 91.49
OR INDEX(TOTAL T/E) = 88.35

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.38 CU FT
CONSTRAINED TO 75.0 PCT OR 4284.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 20201.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0090		3.0	47.0		12.0	188.0	4	4	4.		12.0	
A0320		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A0490		1.0	12.0		4.0	43.0	4	2	4.		4.0	
A0710		1.0	42.0		1.0	42.0	1	2	1.		1.0	
A0922		1.0	3.0		3.0	9.0	3	2	3.		3.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1570		1.0	45.0		1.0	45.0	1	2	1.		1.0	
A1730		1.0	22.0		6.0	132.0	6	4	6.		6.0	
A1800		1.0	56.0		5.0	280.0	5	4	5.		5.0	
A1900	70.0		4190.0	70.0		4190.0	1	4	1.	69.5		
A1920	61.0		2535.0	122.0		5070.0	2	4	2.	109.5		
A1930	60.0		2670.0	180.0		8010.0	3	4	2.	148.1		1.
A1940		350.0	2575.0		350.0	2575.0	1	4	0.		48.3	1.
A2020		8.0	139.0		8.0	139.0	1	4	1.		8.0	
A2050		1.0	20.0		6.0	120.0	6	4	6.		6.0	
A2480		1.0	28.0		2.0	56.0	2	4	2.		2.0	
A2700		1.0	20.0		1.0	20.0	1	2	1.		1.0	
A2710		1.0	25.0		1.0	25.0	1	2	1.		1.0	
A3280		1.0	15.0		1.0	15.0	1	2	1.		1.0	
B0465	54.0		2641.0	54.0		2641.0	1	4	1.	54.0		
B1280		55.0	1750.0		55.0	1750.0	1	1	1.		55.0	
B1620		10.0	220.0		40.0	880.0	4	2	4.		40.0	
B2220		4.2	140.0		17.0	560.0	4	2	4.		17.0	
C2010		.3	4.0		6.2	80.0	20	1	20.		6.2	
C2030		.5	6.0		9.6	120.0	20	1	20.		9.6	
C2040		.3	3.0		10.8	120.0	40	1	31.		8.4	9.
C2050		.8	7.0		15.0	140.0	20	1	20.		15.0	
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.8	15.0	5	1	5.		.8	
C2160		.1	1.0		2.8	40.0	40	1	34.		2.4	6.
C2230		.0	1.0		.0	4.0	4	1	4.		.0	
C2250		.2	2.0		3.0	40.0	20	1	20.		3.0	
C2310		.7	2.0		13.6	40.0	20	1	20.		13.6	
C3020		1.0	16.0		271.3	4384.0	274	1	191.		189.0	83.
C4000		6.3	80.0		25.2	320.0	4	1	4.		25.2	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.3	20.0	4	1	4.		.3	
C4040		3.3	40.0		16.3	200.0	5	1	5.		16.3	
C4140		.5	10.0		2.0	40.0	4	1	4.		2.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		44.0	256.0	4	1	4.		44.0	

NOTE:

Unit = M1658
Constraint = 75%

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.38 CU FT
CONSTRAINED TO 75.0 PCT OR 4284.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 20201.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFICIENCY
C4390		7.7	60.0		23.0	180.0	3	1	3.		23.0	
C4435		.0	1.0		1.5	151.0	151	1	151.		1.5	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		9.8	200.0	5	1	5.		9.8	
C4790		7.7	40.0		38.4	200.0	5	1	5.		38.4	
C4820		15.0	150.0		30.0	300.0	2	1	2.		30.0	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C4880		3.6	8.0		53.4	120.0	15	1	15.		53.4	
C4930		.4	12.0		1.4	48.0	4	1	4.		1.4	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C4980		14.0	150.0		224.0	2400.0	16	1	12.		170.6	4.
C5080		15.0	250.0		45.0	750.0	3	1	3.		45.0	
C5090		4.0	196.0		4.0	196.0	1	1	1.		4.0	
C5110		2.7	14.0		18.6	98.0	7	1	7.		18.6	
C5200		3.8	4.0		41.6	44.0	11	1	11.		41.6	
C5320		8.2	162.0		81.6	1620.0	10	1	10.		81.6	
C5400		7.0	150.0		90.5	1950.0	13	1	13.		90.5	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		200.0	2824.0	8	1	8.		200.0	
C5870		4.3	38.0		34.2	304.0	8	1	8.		34.2	
C5930		2.8	100.0		13.8	500.0	5	1	5.		13.8	
C5990		1.5	31.0		5.8	124.0	4	1	4.		5.8	
C6140		.2	7.0		1.1	42.0	6	1	6.		1.1	
C6220		.5	5.0		2.0	20.0	4	1	4.		2.0	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6370		6.3	107.0		25.2	428.0	4	1	4.		25.2	
C6388		5.9	140.0		88.0	2100.0	15	1	15.		86.4	
C6390		7.2	257.0		35.9	1285.0	5	1	5.		35.9	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		476.0	8592.0	4	1	1.		65.7	3.
C6490		1.5	62.0		42.0	1736.0	28	1	19.		28.1	9.
C6510		6.9	90.0		27.5	360.0	4	1	4.		27.5	
C6650		50.0	300.0		150.0	900.0	3	1	3.		150.0	
C6670		.9	18.0		.9	18.0	1	1	1.		.9	
C6684		.0	1.0		.4	37.0	37	1	37.		.4	
D0070		1.4	28.0		1.4	28.0	1	4	1.		1.4	
D0030	38.0		1054.0	114.0		3152.0	3	4	3.	98.7		
D0170		4.0	517.0		72.0	9306.0	18	1	16.		64.6	2.
D0190	119.0		5855.0	357.0		17565.0	3	4	2.	268.7		1.
[illegible]		1.4	21.0		5.5	84.0	4	4	4.		5.5	

CONSTRAINED T/E FOR UNIT M1658

MOTOR TRANSPORT BATTALION, MARINE DIV

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5712.33 CU FT
CONSTRAINED TO 75.0 PCT OR 4284.00 CU FT

SQUARE OF PUBLISHED T/E IS 26935.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 20201.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
D0400		.5	16.0		2.1	64.0	4	4	4.		2.1	
D0410		.6	16.0		2.5	64.0	4	4	4.		2.5	
D0420		.7	11.0		5.0	77.0	7	4	7.		5.0	
D0725		125.0	1832.0		875.0	12824.0	7	4	7.		875.0	
D0740		35.8	710.0		465.4	9230.0	13	4	13.		465.4	
D0750		.3	8.0		1.0	24.0	3	4	3.		1.0	
D0770		90.7	1890.0		362.8	7560.0	4	4	4.		362.8	
D0840	45.0		570.0	598.0		7410.0	13	4	8.	359.2		5.
D0860	96.0		2750.0	5760.0		165000.0	60	4	36.	3497.4		24.
D0880	93.0		2710.0	465.0		13550.0	5	4	3.	324.1		2.
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	61.3		
D1030	176.0		13660.0	16896.0		1311360.0	96	8	77.	13635.8		19.
D1110	185.0		14970.0	555.0		44910.0	3	8	3.	544.7		
D1160	61.0		2400.0	976.0		38400.0	16	4	9.	549.3		7.
D1210	239.0		34250.0	717.0		102750.0	3	4	2.	480.6		1.
D1250		.0	2.0		.1	8.0	4	1	4.		.1	
E0080		.1	3.0		2.3	57.0	19	1	19.		2.3	
E0980		3.0	89.0		91.8	2759.0	31	2	21.		61.4	10.
E0990		1.3	24.0		18.2	336.0	14	4	14.		18.2	
E1120		.5	12.0		6.7	168.0	14	1	14.		6.7	
E1150		28.0	530.0		840.0	15900.0	30	1	11.		315.4	19.
E1155		0.0	0.0		0.0	0.0	4	2	4.		0.0	
E1156		0.0	0.0		0.0	0.0	2	2	2.		0.0	
E2030		1.1	39.0		1.1	39.0	1	4	1.		1.1	
GRAND TOTALS				26935.0	5712.4	1830193.0	1346		1141.	20201.0	4284.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 74.92
OR INDEX(CUBE) = 89.09
OR INDEX(TOTAL T/E) = 82.60

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP).FORCE TROOPS

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 90.0 PCT OR 6623.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 9924.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E***** QTY	SQUARE	CUBE	DEFIC-IENCY
A0090		3.0	47.0		12.0	188.0	4	8	4.		12.0	
A0320		1.0	20.0		9.0	180.0	9	8	9.		9.0	
A0490		1.0	12.0		4.0	48.0	4	4	4.		4.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0730		3.0	96.0		3.0	96.0	1	4	1.		3.0	
A0922		1.0	3.0		4.0	12.0	4	4	4.		4.0	
A1083		1.0	13.0		6.0	78.0	6	4	6.		6.0	
A1150		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1570		1.0	45.0		3.0	135.0	3	4	3.		3.0	
A1630		1.0	45.0		4.0	180.0	4	4	4.		4.0	
A1730		1.0	22.0		6.0	132.0	6	8	6.		6.0	
A1800		1.0	56.0		3.0	168.0	3	8	3.		3.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	183.0		7605.0	3	8	3.	183.0		
A1930	60.0		2670.0	60.0		2670.0	1	8	1.	60.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		17.0	340.0	17	8	17.		17.0	
A2182	60.0		3370.0	360.0		20220.0	6	8	6.	354.7		
A2184		2.0	55.0		12.0	330.0	6	8	6.		12.0	
A2480		1.0	28.0		4.0	112.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		1.0	25.0	1	4	1.		1.0	
A3290		1.0	15.0		1.0	15.0	1	4	1.		1.0	
B0090		4.0	110.0		4.0	110.0	1	4	1.		4.0	
B0465	54.0		2641.0	54.0		2641.0	1	4	1.	54.0		
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
B0780	6.0		285.0	12.0		570.0	2	4	2.	12.0		
B0980	22.0		3560.0	22.0		3560.0	1	4	1.	22.0		
B1620		10.0	220.0		10.0	220.0	1	2	1.		10.0	
B1640		23.0	425.0		23.0	425.0	1	4	1.		23.0	
B2110		813.0	15600.0		2439.0	45800.0	3	8	2.		2031.2	1.
B2160		12.0	55.0		36.0	165.0	3	8	3.		36.0	
B2322		.0	1.0		.1	3.0	3	4	3.		.1	
B2380		1.4	88.0		1.4	88.0	1	4	1.		1.4	
B2462	153.0		47650.0	459.0		142950.0	3	4	2.	378.7		1.
B2705	12.0		3165.0	36.0		9495.0	3	4	3.	36.0		
C2010		31.0	4.0		155.0	20.0	5	1	5.		155.0	
C2030		48.0	6.0		480.0	60.0	10	1	9.		419.1	1.

NOTE:

Unit = M4112

Constraint = 90%

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 90.0 PCT OR 6623.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 9924.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C2040		27.0	3.0		270.0	30.0	10	1	10.		270.0	
C2050		75.0	7.0		375.0	35.0	5	1	5.		337.6	
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.7	12.0	4	1	4.		.7	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4140		.5	10.0		2.0	40.0	4	1	4.		2.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		77.0	448.0	7	1	7.		77.0	
C4330		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.8	80.0	80	1	80.		.8	
C4460		26.0	400.0		26.0	400.0	1	1	1.		26.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		45.0	450.0	3	1	3.		45.0	
C4870		6.4	85.0		19.1	255.0	3	1	3.		19.1	
C4880		3.6	8.0		39.2	88.0	11	1	11.		39.2	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C4980		14.0	150.0		196.0	2100.0	14	1	14.		189.8	
C4990		1.3	5.0		19.5	75.0	15	1	15.		19.5	
C5080		15.0	250.0		15.0	250.0	1	1	1.		15.0	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		21.3	112.0	8	1	8.		21.3	
C5200		3.8	4.0		22.7	24.0	6	1	6.		22.7	
C5320		8.2	162.0		16.3	324.0	2	1	2.		16.3	
C5400		7.0	150.0		27.8	600.0	4	1	4.		27.8	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5870		4.3	38.0		17.1	152.0	4	1	4.		17.1	
C5930		2.8	100.0		16.6	600.0	6	1	6.		16.6	
C6140		.2	7.0		.7	28.0	4	1	4.		.7	
C6220		.5	7.0		1.0	14.0	2	1	2.		1.0	
C6370		6.3	107.0		12.6	214.0	2	1	2.		12.6	

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7352.05 CU FT
CONSTRAINED TO 90.0 PCT OR 6621.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 9924.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFICIENCY
C6388		5.9	140.0		93.9	2240.0	16	1	16.		93.7	
C6400		7.2	257.0		64.6	2313.0	9	1	9.		64.6	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		239.0	4295.0	2	1	1.		118.6	1.
C6500		1.0	12.0		3.0	36.0	3	1	3.		3.0	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6670		.9	18.0		2.8	54.0	3	1	3.		2.8	
C6684		.0	1.0		.3	32.0	32	1	32.		.3	
D0070		1.4	28.0		1.4	28.0	1	4	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	8	1.	125.0		
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	4	1.		20.0	
D0170		4.0	517.0		12.0	1551.0	3	4	3.		12.0	
D0180		5.0	778.0		15.0	2334.0	3	4	3.		15.0	
D0190	119.0		5855.0	119.0		5855.0	1	4	1.	119.0		
D0390		1.4	21.0		1.4	21.0	1	4	1.		1.4	
D0400		.5	16.0		.5	16.0	1	4	1.		.5	
D0410		.6	16.0		.6	16.0	1	4	1.		.6	
D0420		.7	11.0		1.4	22.0	2	4	2.		1.4	
D0725		125.0	1832.0		125.0	1832.0	1	4	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	4	1.		35.8	
D0750		.3	8.0		.3	8.0	1	4	1.		.3	
D0765		.0	1.0		.0	1.0	1	4	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	4	1.		90.7	
D0840	46.0		570.0	322.0		3990.0	7	8	7.	321.0		
D0860	96.0		2750.0	1152.0		33000.0	12	8	11.	1018.3		1.
D0875	44.0		610.0	44.0		610.0	1	8	1.	44.0		
D0880	93.0		2710.0	372.0		10840.0	4	8	4.	372.0		
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	71.0		
D1020	134.0		7370.0	938.0		51590.0	7	8	7.	898.9		
D1050	206.0		19800.0	3502.0		336600.0	17	8	14.	2955.2		3.
D1110	185.0		14970.0	555.0		44910.0	3	4	2.	447.2		1.
D1160	61.0		2400.0	488.0		19200.0	8	8	8.	461.7		
D1210	239.0		34250.0	239.0		34250.0	1	4	1.	229.4		
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E0020		.3	15.0		.3	15.0	1	1	1.		.3	
E0090		39.0	7.0		546.0	98.0	14	1	11.		441.9	3.
E0170		5.0	105.0		15.0	315.0	3	2	3.		15.0	
E0190		1.0	10.0		6.0	60.0	6	4	6.		6.0	
E0205		1.0	35.0		7.0	245.0	7	8	7.		7.0	
E0210		.0	1.0		.0	2.0	2	1	2.		.0	
E0250		24.0	511.0		24.0	511.0	1	8	1.		24.0	

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 90.0 PCT OR 6623.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 9924.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
E0280		4.0	80.0		12.0	240.0	3	2	3.		12.0	
E0690	253.0		58500.0	1518.0		351000.0	6	8	6.	1393.4		
E0892		0.0	0.0		0.0	0.0	10	4	10.		0.0	
E0930		3.0	89.0		17.8	534.0	6	4	6.		17.8	
E0990		1.3	24.0		7.8	144.0	6	4	6.		7.8	
E1120		.5	12.0		2.9	72.0	6	1	6.		2.9	
E1150		28.0	530.0		168.0	3180.0	6	1	6.		168.0	
E1165		8.0	150.0		24.0	450.0	3	8	3.		24.0	
E1200		9.5	60.0		37.9	240.0	4	8	4.		37.9	
E1240		.0	1.0		.1	2.0	2	4	2.		.1	
E1260		1.0	3.0		3.0	9.0	3	8	3.		3.0	
E1375	218.0		48448.0	218.0		48448.0	1	2	1.	193.5		
E1390		10.0	94.0		10.0	94.0	1	8	1.		10.0	
E2030		1.1	39.0		1.1	39.0	1	4	1.		1.1	
E2090		124.0	1960.0		124.0	1960.0	1	4	1.		124.0	
E3120		4.4	200.0		4.4	200.0	1	4	1.		4.4	
E3170		18.0	365.0		18.0	365.0	1	4	1.		18.0	
GRAND TOTALS				11027.0	7359.0	1239869.0	644		631.	9924.0	6623.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 92.88
OR INDEX(CUBE) = 99.30
OR INDEX(TOTAL T/E) = 97.25

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 85.0 PCT OR 6255.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 9373.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E**** CUBE	DEFIC-IENCY
A0090		3.0	47.0		12.0	188.0	4	8	4.		12.0	
A0320		1.0	20.0		9.0	180.0	9	8	9.		9.0	
A0490		1.0	12.0		4.0	48.0	4	4	4.		4.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0730		3.0	96.0		3.0	96.0	1	4	1.		3.0	
A0922		1.0	3.0		4.0	12.0	4	4	4.		4.0	
A1083		1.0	13.0		6.0	78.0	6	4	6.		6.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1570		1.0	45.0		3.0	135.0	3	4	3.		3.0	
A1630		1.0	45.0		4.0	180.0	4	4	4.		4.0	
A1730		1.0	22.0		6.0	132.0	6	8	6.		6.0	
A1800		1.0	56.0		3.0	168.0	3	8	3.		3.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	140.0		
A1920	61.0		2535.0	183.0		7605.0	3	8	3.	183.0		
A1930	60.0		2670.0	60.0		2670.0	1	8	1.	60.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		17.0	340.0	17	8	17.		17.0	
A2182	60.0		3370.0	360.0		20220.0	6	8	6.	338.7		
A2184		2.0	55.0		12.0	330.0	6	8	6.		12.0	
A2480		1.0	28.0		4.0	112.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		1.0	25.0	1	4	1.		1.0	
A3280		1.0	15.0		1.0	15.0	1	4	1.		1.0	
B0090		4.0	110.0		4.0	110.0	1	4	1.		4.0	
B0465	54.0		2641.0	54.0		2641.0	1	4	1.	54.0		
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
B0780	6.0		285.0	12.0		570.0	2	4	2.	12.0		
B0980	22.0		3560.0	22.0		3560.0	1	4	1.	22.0		
B1620		10.0	220.0		10.0	220.0	1	2	1.		10.0	
B1640		23.0	425.0		23.0	425.0	1	4	1.		23.0	
B2110		813.0	15600.0		2439.0	46800.0	3	8	2.		1827.4	1.
B2160		12.0	55.0		36.0	165.0	3	8	3.		36.0	
B2322		.0	1.0		.1	3.0	3	4	3.		.1	
B2380		1.4	88.0		1.4	88.0	1	4	1.		1.4	
B2462	153.0		47650.0	459.0		142950.0	3	4	2.	327.8		1.
B2705	12.0		3165.0	36.0		9495.0	3	4	3.	34.6		
C2010		31.0	4.0		155.0	20.0	5	1	5.		155.0	
C2030		48.0	6.0		480.0	60.0	10	1	8.		388.6	2.

NOTE:

Unit = M4112

Constraint = 85%

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 85.0 PCT OR 6255.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 9373.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E***** SQUARE	CUBE	DEFIC-IENCY
C2040		27.0	3.0		270.0	30.0	10	1	10.		270.0	
C2050		75.0	7.0		375.0	35.0	5	1	4.		318.9	1.
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.7	12.0	4	1	4.		.7	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4140		.5	10.0		2.0	40.0	4	1	4.		2.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		77.0	448.0	7	1	7.		77.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.8	80.0	80	1	80.		.8	
C4460		26.0	400.0		26.0	400.0	1	1	1.		26.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		45.0	450.0	3	1	3.		45.0	
C4870		6.4	85.0		19.1	255.0	3	1	3.		19.1	
C4880		3.6	8.0		39.2	88.0	11	1	11.		39.2	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C4980		14.0	150.0		196.0	2100.0	14	1	13.		186.7	1.
C4990		1.3	5.0		19.5	75.0	15	1	15.		19.5	
C5080		15.0	250.0		15.0	250.0	1	1	1.		15.0	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		21.3	112.0	8	1	8.		21.3	
C5200		3.8	4.0		22.7	24.0	6	1	6.		22.7	
C5320		8.2	162.0		16.3	324.0	2	1	2.		16.3	
C5400		7.0	150.0		27.8	600.0	4	1	4.		27.8	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5870		4.3	38.0		17.1	152.0	4	1	4.		17.1	
C5930		2.8	100.0		16.6	600.0	6	1	6.		16.6	
C6140		.2	7.0		.7	23.0	4	1	4.		.7	
C6220		.5	7.0		1.0	14.0	2	1	2.		1.0	
C6370		6.3	107.0		12.6	214.0	2	1	2.		12.6	

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 85.0 PCT OR 6255.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 9373.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C6388		5.9	140.0		93.9	2240.0	16	1	16.		93.5	
C6390		7.2	257.0		64.6	2313.0	9	1	9.		64.6	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		238.0	4296.0	2	1	0.		59.0	2.
C6500		1.0	12.0		3.0	36.0	3	1	3.		3.0	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6670		.9	18.0		2.8	54.0	3	1	3.		2.8	
C6684		.0	1.0		.3	32.0	32	1	32.		.3	
D0070		1.4	28.0		1.4	28.0	1	4	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	8	1.	125.0		
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	4	1.		20.0	
D0170		4.0	517.0		12.0	1551.0	3	4	3.		12.0	
D0180		5.0	778.0		15.0	2334.0	3	4	3.		15.0	
D0190	119.0		5855.0	119.0		5855.0	1	4	1.	106.4		
D0390		1.4	21.0		1.4	21.0	1	4	1.		1.4	
D0400		.5	16.0		.5	16.0	1	4	1.		.5	
D0410		.6	16.0		.6	16.0	1	4	1.		.6	
D0420		.7	11.0		1.4	22.0	2	4	2.		1.4	
D0725		125.0	1832.0		125.0	1832.0	1	4	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	4	1.		35.8	
D0750		.3	8.0		.3	8.0	1	4	1.		.3	
D0765		.0	1.0		.0	1.0	1	4	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	4	1.		90.7	
D0840	46.0		570.0	322.0		3990.0	7	8	7.	308.9		
D0860	96.0		2750.0	1152.0		33000.0	12	8	10.	982.0		2.
D0875	44.0		610.0	44.0		610.0	1	8	1.	44.0		
D0880	93.0		2710.0	372.0		10840.0	4	8	4.	358.3		
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	70.3		
D1020	134.0		7370.0	938.0		51590.0	7	8	6.	859.6		1.
D1050	206.0		19800.0	3502.0		336600.0	17	8	14.	2855.9		3.
D1110	185.0		14970.0	555.0		44910.0	3	4	2.	333.5		1.
D1160	61.0		2400.0	488.0		19200.0	8	8	7.	443.4		1.
D1210	239.0		34250.0	239.0		34250.0	1	4	1.	178.3		
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E0020		.3	15.0		.3	15.0	1	1	1.		.3	
E0090		39.0	7.0		546.0	98.0	14	1	10.		389.8	4.
E0170		5.0	105.0		15.0	315.0	3	2	3.		15.0	
E0180		1.0	10.0		6.0	60.0	6	4	6.		6.0	
E0205		1.0	35.0		7.0	245.0	7	8	7.		7.0	
E0210		.0	1.0		.0	2.0	2	1	2.		.0	
[illegible]		24.0	511.0		24.0	511.0	1	8	1.		24.0	

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 85.0 PCT OR 6255.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 9373.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
E0280		4.0	80.0		12.0	240.0	3	2	3.		12.0	
E0690	253.0		58500.0	1518.0		351000.0	6	8	5.	1317.9		1.
E0892		0.0	0.0		0.0	0.0	10	4	10.		0.0	
E0980		3.0	89.0		17.9	534.0	6	4	6.		17.8	
E0990		1.3	24.0		7.8	144.0	6	4	6.		7.8	
E1120		.5	12.0		2.9	72.0	6	1	6.		2.9	
E1150		28.0	530.0		168.0	3180.0	6	1	6.		168.0	
E1165		8.0	150.0		24.0	450.0	3	8	3.		24.0	
E1200		9.5	60.0		37.9	240.0	4	8	4.		37.9	
E1240		.0	1.0		.1	2.0	2	4	2.		.1	
E1260		1.0	3.0		3.0	9.0	3	8	3.		3.0	
E1375	218.0		48448.0	218.0		48448.0	1	2	1.	129.5		
E1390		10.0	94.0		10.0	94.0	1	8	1.		10.0	
E2030		1.1	39.0		1.1	39.0	1	4	1.		1.1	
E2090		124.0	1960.0		124.0	1960.0	1	4	1.		124.0	
E3120		4.4	200.0		4.4	200.0	1	4	1.		4.4	
E3170		18.0	365.0		18.0	365.0	1	4	1.		18.0	
GRAND TOTALS				11027.0	7359.0	1239869.0	644		624.	9373.0	6255.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 89.21
OR INDEX(CUBE) = 98.96
OR INDEX(TOTAL T/E) = 95.84

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 75.0 PCT OR 5519.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 8270.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFIC-IENCY
A0090		3.0	47.0		12.0	188.0	4	8	4.		12.0	
A0320		1.0	20.0		9.0	180.0	9	8	9.		9.0	
A0490		1.0	12.0		4.0	48.0	4	4	4.		4.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0730		3.0	96.0		3.0	96.0	1	4	1.		3.0	
A0922		1.0	3.0		4.0	12.0	4	4	4.		4.0	
A1083		1.0	13.0		6.0	78.0	6	4	6.		6.0	
A1180		1.0	26.0		1.0	26.0	1	4	1.		1.0	
A1240		8.0	252.0		8.0	252.0	1	4	1.		8.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1570		1.0	45.0		3.0	135.0	3	4	3.		3.0	
A1630		1.0	45.0		4.0	180.0	4	4	4.		4.0	
A1730		1.0	22.0		6.0	132.0	6	8	6.		6.0	
A1800		1.0	56.0		3.0	168.0	3	8	3.		3.0	
A1900	70.0		4190.0	140.0		8380.0	2	8	2.	131.8		
A1920	61.0		2535.0	183.0		7605.0	3	8	3.	177.6		
A1930	60.0		2670.0	60.0		2670.0	1	8	1.	60.0		
A1940		350.0	2575.0		700.0	5150.0	2	8	2.		700.0	
A2010		8.0	101.0		24.0	303.0	3	8	3.		24.0	
A2020		8.0	139.0		40.0	695.0	5	8	5.		40.0	
A2040		1.0	23.0		3.0	69.0	3	8	3.		3.0	
A2050		1.0	20.0		17.0	340.0	17	8	17.		17.0	
A2182	60.0		3370.0	360.0		20220.0	6	8	5.	314.2		1.
A2184		2.0	55.0		12.0	330.0	6	8	6.		12.0	
A2480		1.0	28.0		4.0	112.0	4	8	4.		4.0	
A2700		1.0	20.0		1.0	20.0	1	4	1.		1.0	
A2710		1.0	25.0		1.0	25.0	1	4	1.		1.0	
A3280		1.0	15.0		1.0	15.0	1	4	1.		1.0	
B0090		4.0	110.0		4.0	110.0	1	4	1.		4.0	
B0465	54.0		2641.0	54.0		2641.0	1	4	1.	42.6		
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
B0780	6.0		285.0	12.0		570.0	2	4	2.	12.0		
B0980	22.0		3560.0	22.0		3560.0	1	4	1.	21.4		
B1620		10.0	220.0		10.0	220.0	1	2	1.		10.0	
B1640		23.0	425.0		23.0	425.0	1	4	1.		23.0	
B2110		813.0	15600.0		2439.0	46800.0	3	8	2.		1721.5	1.
B2160		12.0	55.0		36.0	165.0	3	8	3.		36.0	
B2322		.0	1.0		.1	3.0	3	4	3.		.1	
B2380		1.4	88.0		1.4	88.0	1	4	1.		1.4	
B2462	153.0		47650.0	459.0		142950.0	3	4	1.	225.9		2.
B2705	12.0		3165.0	36.0		9495.0	3	4	3.	30.4		
C2010		31.0	4.0		155.0	20.0	5	1	5.		155.0	
C2030		48.0	6.0		480.0	60.0	10	1	5.		242.8	5.

NOTE:

Unit = 4112

Constraint = 75%

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 75.0 PCT OR 5519.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 8270.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C2040		27.0	3.0		270.0	30.0	10	1	9.		233.5	1.
C2050		75.0	7.0		375.0	35.0	5	1	1.		44.0	4.
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.7	12.0	4	1	4.		.7	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4140		.5	10.0		2.0	40.0	4	1	4.		2.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		77.0	448.0	7	1	7.		77.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.8	80.0	80	1	80.		.8	
C4460		26.0	400.0		26.0	400.0	1	1	1.		26.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		45.0	450.0	3	1	3.		45.0	
C4870		6.4	85.0		19.1	255.0	3	1	3.		19.1	
C4880		3.6	8.0		39.2	88.0	11	1	11.		39.2	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C4980		14.0	150.0		196.0	2100.0	14	1	12.		166.0	2.
C4990		1.3	5.0		19.5	75.0	15	1	15.		19.5	
C5080		15.0	250.0		15.0	250.0	1	1	1.		15.0	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		21.3	112.0	8	1	8.		21.3	
C5200		3.8	4.0		22.7	24.0	6	1	6.		22.7	
C5320		8.2	162.0		16.3	324.0	2	1	2.		16.3	
C5400		7.0	150.0		27.8	600.0	4	1	4.		27.8	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5870		4.3	38.0		17.1	152.0	4	1	4.		17.1	
C5920		2.8	100.0		16.6	600.0	6	1	6.		16.6	
C6140		.2	7.0		.7	28.0	4	1	4.		.7	
C6220		.5	7.0		1.0	14.0	2	1	2.		1.0	
C6370		6.3	107.0		12.6	214.0	2	1	2.		12.6	

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 75.0 PCT OR 5519.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 8270.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
C6388		5.9	140.0		93.9	2240.0	16	1	15.		87.1	1.
C6390		7.2	257.0		64.6	2313.0	9	1	9.		64.6	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		238.0	4296.0	2	1	0.		27.9	2.
C6500		1.0	12.0		3.0	36.0	3	1	3.		3.0	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6670		.9	18.0		2.8	54.0	3	1	3.		2.8	
C6684		.0	1.0		.3	32.0	32	1	32.		.3	
D0070		1.4	28.0		1.4	28.0	1	4	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	8	1.	125.0		
D0090	38.0		1054.0	38.0		1054.0	1	4	1.	32.9		
D0100		20.0	163.0		20.0	163.0	1	4	1.		20.0	
D0170		4.0	517.0		12.0	1551.0	3	4	3.		12.0	
D0180		5.0	778.0		15.0	2334.0	3	4	3.		15.0	
D0190	119.0		5855.0	119.0		5855.0	1	4	1.	69.9		
D0370		1.4	21.0		1.4	21.0	1	4	1.		1.4	
D0400		.5	16.0		.5	16.0	1	4	1.		.5	
D0410		.6	16.0		.6	16.0	1	4	1.		.6	
D0420		.7	11.0		1.4	22.0	2	4	2.		1.4	
D0725		125.0	1832.0		125.0	1832.0	1	4	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	4	1.		35.8	
D0750		.3	8.0		.3	8.0	1	4	1.		.3	
D0765		.0	1.0		.0	1.0	1	4	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	4	1.		90.7	
D0840	46.0		570.0	322.0		3990.0	7	8	6.	271.0		1.
D0860	96.0		2750.0	1152.0		33000.0	12	8	10.	916.0		2.
D0875	44.0		610.0	44.0		610.0	1	8	1.	44.0		
D0880	93.0		2710.0	372.0		10840.0	4	8	4.	325.6		
D0890	71.0		2780.0	71.0		2780.0	1	4	1.	51.4		
D1020	134.0		7370.0	938.0		51590.0	7	8	6.	794.9		1.
D1050	206.0		19800.0	3502.0		336600.0	17	8	13.	2655.8		4.
D1110	185.0		14970.0	555.0		44910.0	3	4	1.	264.6		2.
D1160	61.0		2400.0	488.0		19200.0	8	8	7.	413.5		1.
D1210	239.0		34250.0	239.0		34250.0	1	4	0.	94.4		1.
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E0020		.3	15.0		.3	15.0	1	1	1.		.3	
E0090		39.0	7.0		546.0	98.0	14	1	7.		275.0	7.
E0170		5.0	105.0		15.0	315.0	3	2	3.		15.0	
E0180		1.0	10.0		6.0	60.0	6	4	6.		6.0	
E0205		1.0	35.0		7.0	245.0	7	8	7.		7.0	
E0210		.0	1.0		.0	2.0	2	1	2.		.0	
E0250		24.0	511.0		24.0	511.0	1	8	1.		24.0	

CONSTRAINED T/E FOR UNIT M4112

8-INCH HOWITZER BATTERY(SP),FORCE TROOPS

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 7359.05 CU FT
CONSTRAINED TO 75.0 PCT OR 5519.00 CU FT

SQUARE OF PUBLISHED T/E IS 11027.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 8270.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
E0280		4.0	80.0		12.0	240.0	3	2	3.		12.0	
E0690	253.0		58500.0	1518.0		351000.0	6	8	5.	1174.0		1.
E0492		0.0	0.0		0.0	0.0	10	4	10.		0.0	
E0980		3.0	89.0		17.8	534.0	6	4	6.		17.8	
E0990		1.3	24.0		7.8	144.0	6	4	6.		7.8	
E1120		.5	12.0		2.9	72.0	6	1	6.		2.9	
E1150		28.0	530.0		168.0	3180.0	6	1	6.		168.0	
E1165		8.0	150.0		24.0	450.0	3	8	3.		24.0	
E1200		9.5	60.0		37.9	240.0	4	8	4.		37.9	
E1240		.0	1.0		.1	2.0	2	4	2.		.1	
E1260		1.0	3.0		3.0	9.0	3	8	3.		3.0	
E1375	218.0		48448.0	218.0		48448.0	1	2	0.	11.3		1.
E1390		10.0	94.0		10.0	94.0	1	8	1.		10.0	
E2030		1.1	39.0		1.1	39.0	1	4	1.		1.1	
E2090		124.0	1960.0		124.0	1960.0	1	4	1.		124.0	
E3120		4.4	200.0		4.4	200.0	1	4	1.		4.4	
E3170		18.0	365.0		18.0	365.0	1	4	1.		18.0	
GRAND TOTALS				11027.0	7359.0	1239869.0	644		602.	8270.0	5519.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 81.82
OR INDEX(CUBE) = 97.92
OR INDEX(TOTAL T/E) = 92.78

CONSTRAINED T/E FOR UNIT M1938

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21615.34 CU FT
CONSTRAINED TO 90.0 PCT OR 19455.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 19383.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0005		5.0	159.0		15.0	477.0	3	8	3.		15.0	
A0090		3.0	47.0		36.0	564.0	12	8	12.		36.0	
A0130		1.0	3.0		2.0	6.0	2	4	2.		2.0	
A0240	162.0		8100.0	162.0		8100.0	1	8	1.	162.0		
A0265		0.0	0.0		0.0	0.0	2	8	2.		0.0	
A0270	41.0		1975.0	205.0		9875.0	5	8	5.	205.0		
A0320		1.0	20.0		25.0	500.0	25	8	25.		25.0	
A0328		1.0	9.0		10.0	90.0	10	8	10.		10.0	
A0490		1.0	12.0		10.0	120.0	10	8	10.		10.0	
A0660		1.0	42.0		2.0	84.0	2	4	2.		2.0	
A0685		0.0	0.0		0.0	0.0	1	4	1.		0.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0730		3.0	96.0		6.0	192.0	2	4	2.		6.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0810		4.0	115.0		8.0	230.0	2	8	2.		8.0	
A0870		7.0	182.0		21.0	546.0	3	8	3.		21.0	
A0912		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A1180		1.0	26.0		3.0	78.0	3	4	3.		3.0	
A1190		4.0	104.0		8.0	208.0	2	4	2.		8.0	
A1250		1.0	10.0		4.0	40.0	4	4	4.		4.0	
A1290		36.0	1122.0		72.0	2244.0	2	8	2.		72.0	
A1300		7.0	523.0		14.0	1046.0	2	8	2.		14.0	
A1420		11.0	93.0		22.0	186.0	2	8	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	8	1.		1.0	
A1630		1.0	33.0		2.0	66.0	2	8	2.		2.0	
A1730		1.0	22.0		25.0	550.0	25	8	25.		25.0	
A1800		1.0	56.0		14.0	784.0	14	8	14.		14.0	
A1890		1242.0	9950.0		3726.0	29850.0	3	8	3.		3726.0	
A1900	70.0		4190.0	1050.0		62850.0	15	8	14.	1005.8		1.
A1920	61.0		2535.0	366.0		15210.0	6	8	6.	366.0		
A1930	60.0		2670.0	360.0		16020.0	6	8	6.	360.0		
A1940		350.0	2575.0		5250.0	38625.0	15	8	15.		5250.0	
A1950		-0.0	0.0		0.0	0.0	2	8	2.		0.0	
A2010		8.0	101.0		64.0	808.0	8	8	8.		64.0	
A2020		8.0	139.0		128.0	2224.0	16	8	16.		128.0	
A2040		1.0	23.0		8.0	184.0	8	8	8.		8.0	
A2050		1.0	20.0		44.0	880.0	44	8	44.		44.0	
A2182	60.0		3370.0	240.0		13480.0	4	8	4.	240.0		
A2183	60.0		2761.0	1560.0		71786.0	26	8	24.	1426.5		2.
A2184		2.0	55.0		16.0	440.0	8	8	8.		16.0	
A2220		2.0	82.0		18.0	738.0	9	8	9.		18.0	
A2270		2.0	38.0		36.0	684.0	18	8	18.		36.0	
A2310	88.0		[illegible]	264.0		[illegible]	3	8	3.	264.0		

NOTE:

Unit = M1988
Constraint = 90%

CONSTRAINED T/E FOR UNIT M1983

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 90.0 PCT OR 19455.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 19383.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A2320	88.0		3100.0	176.0		6200.0	2	4	2.	176.0		
A2330	88.0		4750.0	88.0		4750.0	1	4	1.	88.0		
A2350	80.0		4750.0	80.0		4750.0	1	4	1.	80.0		
A2480		1.0	28.0		14.0	392.0	14	8	14.		14.0	
A2500		10.0	262.0		30.0	786.0	3	8	3.		30.0	
A2510		53.0	145.0		106.0	290.0	2	4	2.		106.0	
A2660		5.0	90.0		40.0	720.0	8	8	8.		40.0	
A2685		1.0	10.0		28.0	280.0	28	8	28.		28.0	
A2700		1.0	20.0		2.0	40.0	2	4	2.		2.0	
A2710		1.0	25.0		4.0	100.0	4	4	4.		4.0	
A2920		10.0	115.0		10.0	115.0	1	4	1.		10.0	
A3012		0.0	0.0		0.0	0.0	2	2	2.		0.0	
A3060		10.0	42.0		10.0	42.0	1	4	1.		10.0	
A3065		1.0	15.0		1.0	15.0	1	4	1.		1.0	
A3238		2.0	21.0		12.0	126.0	6	8	6.		12.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0001	5.0		200.0	10.0		400.0	2	4	2.	10.0		
B0003	2.0		265.0	16.0		2120.0	8	4	8.	15.4		
B0011		0.0	0.0		0.0	0.0	4	1	4.		0.0	
B0455	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0470		6.9	130.0		41.2	780.0	6	2	6.		41.2	
B0490		29.0	312.0		29.0	312.0	1	8	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	4	1.		8.1	
B1350		8.0	255.0		32.0	1020.0	4	4	4.		32.0	
B1430		7.5	138.0		30.0	552.0	4	8	4.		30.0	
B1440		31.0	407.0		31.0	407.0	1	8	1.		31.0	
B1445		0.0	0.0		0.0	0.0	1	8	1.		0.0	
B1620		10.0	220.0		10.0	220.0	1	4	1.		10.0	
B1755		74.0	4471.0		74.0	4471.0	1	8	1.		74.0	
B2080		.4	9.0		2.3	54.0	6	8	6.		2.3	
B2220		4.2	140.0		4.2	140.0	1	4	1.		4.2	
B2390		6.5	100.0		6.5	100.0	1	2	1.		6.5	
C2010		.3	4.0		10.8	140.0	35	1	31.		9.5	4.
C2030		.5	6.0		16.8	210.0	35	1	30.		14.4	5.
C2040		.3	3.0		18.9	210.0	70	1	62.		16.8	8.
C2050		.8	7.0		26.3	245.0	35	1	29.		21.9	6.
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.8	15.0	5	1	5.		.8	
C2160		.1	1.0		4.9	70.0	70	1	70.		4.9	
C2230		.0	1.0		.1	6.0	6	1	6.		.1	
C2250		.2	2.0		5.3	70.0	35	1	32.		4.8	3.
C2310		.7	2.0		23.8	70.0	35	1	29.		20.0	6.

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 90.0 PCT OR 19455.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 19383.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
C3020		1.0	16.0		486.1	7856.0	491	1	403.		399.1	88.
C4000		6.3	80.0		100.8	1280.0	16	1	16.		100.8	
C4010		2.0	50.0		26.0	650.0	13	1	13.		26.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		68.5	840.0	21	1	21.		68.5	
C4140		.5	10.0		3.4	70.0	7	1	7.		3.4	
C4230		.7	45.0		3.4	225.0	5	1	5.		3.4	
C4250		4.2	53.0		21.0	265.0	5	1	5.		21.0	
C4340		11.0	64.0		44.0	256.0	4	1	4.		44.0	
C4390		7.7	60.0		15.3	120.0	2	1	2.		15.3	
C4436		.0	1.0		6.4	638.0	638	1	638.		6.4	
C4640		72.0	918.0		72.0	918.0	1	8	1.		72.0	
C4650		3.0	85.0		18.0	510.0	6	1	6.		18.0	
C4660		12.0	204.0		60.0	1020.0	5	1	5.		60.0	
C4670		1.4	6.0		2.8	12.0	2	1	2.		2.8	
C4680		.2	2.0		.5	6.0	3	1	3.		.5	
C4690		2.0	40.0		50.7	1040.0	26	1	23.		44.7	3.
C4790		7.7	40.0		192.2	1000.0	25	1	20.		156.1	5.
C4820		15.0	150.0		270.0	2700.0	18	1	18.		266.7	
C4830		.1	50.0		.8	750.0	15	1	15.		.8	
C4870		6.4	85.0		101.9	1360.0	16	1	16.		101.9	
C4880		3.6	8.0		213.5	480.0	60	1	45.		160.4	15.
C4980		14.0	150.0		476.0	5100.0	34	1	23.		315.7	11.
C5070		4.2	74.0		8.4	148.0	2	1	2.		8.4	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5090		4.0	196.0		12.1	588.0	3	1	3.		12.1	
C5110		2.7	14.0		93.1	490.0	35	1	27.		71.5	8.
C5200		3.8	4.0		264.6	280.0	70	1	52.		197.9	18.
C5300		.1	1.0		2.2	44.0	44	1	44.		2.2	
C5310		66.0	1012.0		66.0	1012.0	1	1	1.		66.0	
C5320		8.2	162.0		709.9	14094.0	87	1	61.		496.9	26.
C5330		6.6	86.0		6.6	86.0	1	1	1.		6.6	
C5340		8.6	95.0		42.7	475.0	5	1	5.		42.7	
C5370		145.0	2375.0		1740.0	28500.0	12	1	10.		1495.0	2.
C5380		101.0	1306.0		101.0	1305.0	1	1	1.		101.0	
C5390		46.7	756.0		46.7	756.0	1	1	1.		46.7	
C5400		7.0	150.0		577.7	12450.0	83	1	59.		410.2	24.
C5410		9.0	131.0		90.0	1310.0	10	1	10.		90.0	
C5820		25.0	353.0		725.0	10237.0	29	1	18.		449.4	11.
C5830		.9	10.0		21.6	240.0	24	1	24.		21.4	
C5370		4.3	33.0		34.2	304.0	8	1	8.		34.2	
C5910		15.0	1360.0		30.0	2720.0	2	1	2.		30.0	

AD-A041 598 STANFORD RESEARCH INST MENLO PARK CALIF NAVAL WARFAR--ETC F/G 15/5
MATERIEL WEIGHT AND CUBE CONTROL (1975-1980).(U)
MAR 76 T H ALLEN, R B RINGO N00014-75-C-0708
UNCLASSIFIED NL

5 OF 7
ADA041598

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 90.0 PCT OR 19455.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 19383.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C5920		11.0	920.0		99.0	8280.0	9	1	9.		99.0	
C5930		2.8	100.0		162.8	5900.0	59	1	45.		124.8	14.
C5990		1.5	31.0		4.3	93.0	3	1	3.		4.3	
C6000		4.0	134.0		4.0	134.0	1	1	1.		4.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6140		.2	7.0		1.1	42.0	6	1	6.		1.1	
C6150		4.0	138.0		4.0	138.0	1	1	1.		4.0	
C6220		.5	7.0		5.5	77.0	11	1	11.		5.5	
C6260		11.0	5.0		66.0	30.0	6	1	6.		66.0	
C6350		21.0	230.0		126.0	1380.0	6	1	6.		126.0	
C6370		6.3	107.0		157.5	2675.0	25	1	21.		130.2	4.
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		452.3	16191.0	63	1	45.		320.3	18.
C6410		18.0	330.0		774.0	14190.0	43	1	28.		499.2	15.
C6420		119.0	2148.0		238.0	4296.0	2	1	2.		238.0	
C6490		1.5	62.0		34.5	1426.0	23	1	23.		34.2	
C6510		6.9	90.0		27.5	360.0	4	1	4.		27.5	
C6650		50.0	300.0		100.0	600.0	2	1	2.		100.0	
C6660		3.2	30.0		47.4	450.0	15	1	15.		47.4	
C6670		.9	18.0		38.0	720.0	40	1	33.		31.3	7.
C6680		1.0	25.0		2.0	50.0	2	1	2.		2.0	
C6684		.0	1.0		3.3	327.0	327	1	327.		3.3	
D0070		1.4	28.0		2.8	56.0	2	2	2.		2.8	
D0090	38.0		1054.0	76.0		2108.0	2	4	2.	76.0		
D0100		20.0	163.0		40.0	326.0	2	2	2.		40.0	
D0170		4.0	517.0		16.0	2068.0	4	1	4.		16.0	
D0190	119.0		5855.0	119.0		5855.0	1	2	1.	119.0		
D0390		1.4	21.0		2.7	42.0	2	2	2.		2.7	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		1.2	32.0	2	2	2.		1.2	
D0420		.7	11.0		1.4	22.0	2	2	2.		1.4	
D0725		125.0	1832.0		250.0	3664.0	2	2	2.		250.0	
D0730		29.0	660.0		87.0	1980.0	3	2	3.		87.0	
D0740		35.8	710.0		107.4	2130.0	3	2	3.		107.4	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		362.8	7560.0	4	2	4.		362.8	
D0840	46.0		570.0	2622.0		32490.0	57	4	51.	2366.6		6.
D0860	96.0		2750.0	2688.0		77000.0	28	4	25.	2359.2		3.
D0880	93.0		2710.0	465.0		13550.0	5	4	5.	433.9		
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1020	134.0		7370.0	1608.0		88440.0	12	4	10.	1293.9		2.
D1030	176.0		13660.0	4026.0		327840.0	24	4	21.	3620.5		7.

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 90.0 PCT OR 19455.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 19383.00 SQ FT

									*****REDUCED T/E****			
TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	QTY	SQUARE	CUBE	DEFIC-IENCY
D1060	256.0		22960.0	768.0		68880.0	3	4	3.	747.3		
D1160	61.0		2400.0	4026.0		158400.0	66	4	59.	3598.9		7.
D1210	239.0		34250.0	239.0		34250.0	1	2	1.	239.0		
D1250		.0	2.0		.1	8.0	4	1	4.		.1	
E0080		12.0	3.0		324.0	81.0	27	1	18.		218.4	9.
E0090		39.0	7.0		858.0	154.0	22	1	16.		631.6	6.
E0210		.0	1.0		.1	11.0	11	1	11.		.1	
E0320		8.9	108.0		35.7	432.0	4	2	4.		35.7	
E0980		3.0	89.0		20.7	623.0	7	2	7.		20.7	
E0990		1.3	24.0		7.8	144.0	6	4	6.		7.8	
E1155		0.0	0.0		0.0	0.0	8	2	8.		0.0	
E1156		0.0	0.0		0.0	0.0	2	2	2.		0.0	
E1240		.0	1.0		.0	1.0	1	4	1.		.0	
E1403		.0	2.0		.1	4.0	2	2	2.		.1	
E1760		.3	8.0		1.9	48.0	6	2	6.		1.9	
E1900		1.0	5.0		2.0	10.0	2	8	2.		2.0	
E2030		1.1	39.0		2.3	78.0	2	2	2.		2.3	
GRAND TOTALS				21537.0	21616.3	1316058.0	3625		3283.	19383.0	19455.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 91.84
OR INDEX(CUBE) = 94.55
OR INDEX(TOTAL T/E) = 94.03

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 85.0 PCT OR 18374.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 18306.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFICIENCY
A0005		5.0	159.0		15.0	477.0	3	8	3.		15.0	
A0090		3.0	47.0		36.0	564.0	12	8	12.		36.0	
A0130		1.0	3.0		2.0	6.0	2	4	2.		2.0	
A0240	162.0		8100.0	162.0		8100.0	1	8	1.	162.0		
A0265		0.0	0.0		0.0	0.0	2	8	2.		0.0	
A0270	41.0		1975.0	205.0		9875.0	5	8	5.	205.0		
A0320		1.0	20.0		25.0	500.0	25	8	25.		25.0	
A0328		1.0	9.0		10.0	90.0	10	8	10.		10.0	
A0490		1.0	12.0		10.0	120.0	10	8	10.		10.0	
A0660		1.0	42.0		2.0	84.0	2	4	2.		2.0	
A0685		0.0	0.0		0.0	0.0	1	4	1.		0.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0730		3.0	96.0		6.0	192.0	2	4	2.		6.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0810		4.0	115.0		8.0	230.0	2	8	2.		8.0	
A0870		7.0	182.0		21.0	546.0	3	8	3.		21.0	
A0912		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A1180		1.0	26.0		3.0	78.0	3	4	3.		3.0	
A1190		4.0	104.0		8.0	208.0	2	4	2.		8.0	
A1250		1.0	10.0		4.0	40.0	4	4	4.		4.0	
A1290		36.0	1122.0		72.0	2244.0	2	8	2.		72.0	
A1300		7.0	523.0		14.0	1046.0	2	8	2.		14.0	
A1420		11.0	93.0		22.0	186.0	2	8	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	8	1.		1.0	
A1630		1.0	33.0		2.0	66.0	2	8	2.		2.0	
A1730		1.0	22.0		25.0	550.0	25	8	25.		25.0	
A1800		1.0	56.0		14.0	784.0	14	8	14.		14.0	
A1890		1242.0	9950.0		3726.0	29850.0	3	8	3.		3726.0	
A1900	70.0		4190.0	1050.0		62850.0	15	8	14.	983.7		1.
A1920	61.0		2535.0	366.0		15210.0	6	8	6.	366.0		
A1930	60.0		2670.0	360.0		16020.0	6	8	6.	360.0		
A1940		350.0	2575.0		5250.0	38625.0	15	8	15.		5250.0	
A1950		-0.0	0.0		0.0	0.0	2	8	2.		0.0	
A2010		8.0	101.0		64.0	808.0	8	8	8.		64.0	
A2020		8.0	139.0		128.0	2224.0	16	8	16.		128.0	
A2040		1.0	23.0		8.0	184.0	8	8	8.		8.0	
A2050		1.0	20.0		44.0	880.0	44	8	44.		44.0	
A2182	60.0		3370.0	240.0		13480.0	4	8	4.	240.0		
A2183	60.0		2761.0	1560.0		71786.0	26	8	23.	1359.7		3.
A2184		2.0	55.0		16.0	440.0	8	8	8.		16.0	
A2220		2.0	82.0		18.0	738.0	9	8	9.		18.0	
A2270		2.0	38.0		36.0	684.0	18	8	18.		36.0	
A2310	88.0		3300.0	264.0		9900.0	3	8	3.	264.0		

NOTE:

Unit = M1988
Constraint = 85%

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 85.0 PCT OR 18374.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 18306.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A2320	88.0		3100.0	176.0		6200.0	2	4	2.	176.0		
A2340	88.0		4750.0	88.0		4750.0	1	4	1.	88.0		
A2350	80.0		4750.0	80.0		4750.0	1	4	1.	80.0		
A2430		1.0	28.0		14.0	392.0	14	8	14.		14.0	
A2500		10.0	262.0		30.0	786.0	3	8	3.		30.0	
A2510		53.0	145.0		106.0	290.0	2	4	2.		106.0	
A2660		5.0	90.0		40.0	720.0	8	8	8.		40.0	
A2685		1.0	10.0		28.0	280.0	28	8	28.		28.0	
A2700		1.0	20.0		2.0	40.0	2	4	2.		2.0	
A2710		1.0	25.0		4.0	100.0	4	4	4.		4.0	
A2920		10.0	115.0		10.0	115.0	1	4	1.		10.0	
A3012		0.0	0.0		0.0	0.0	2	2	2.		0.0	
A3060		10.0	42.0		10.0	42.0	1	4	1.		10.0	
A3095		1.0	15.0		1.0	15.0	1	4	1.		1.0	
A3238		2.0	21.0		12.0	126.0	6	8	6.		12.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0001	5.0		200.0	10.0		400.0	2	4	2.	10.0		
B0003	2.0		265.0	16.0		2120.0	8	4	8.	15.1		
B0011		0.0	0.0		0.0	0.0	4	1	4.		0.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0470		6.9	130.0		41.2	780.0	6	2	6.		41.2	
B0490		29.0	312.0		29.0	312.0	1	8	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	4	1.		8.1	
B1360		8.0	255.0		32.0	1020.0	4	4	4.		32.0	
B1430		7.5	138.0		30.0	552.0	4	8	4.		30.0	
B1440		31.0	407.0		31.0	407.0	1	8	1.		31.0	
B1445		0.0	0.0		0.0	0.0	1	8	1.		0.0	
B1620		10.0	220.0		10.0	220.0	1	4	1.		10.0	
B1755		74.0	4471.0		74.0	4471.0	1	8	1.		74.0	
B2080		.4	9.0		2.3	54.0	6	8	6.		2.3	
B2220		4.2	140.0		4.2	140.0	1	4	1.		4.2	
B2390		6.5	100.0		6.5	100.0	1	2	1.		6.5	
C2010		.3	4.0		10.8	140.0	35	1	29.		9.0	6.
C2030		.5	6.0		16.8	210.0	35	1	28.		13.6	7.
C2040		.3	3.0		18.9	210.0	70	1	59.		15.8	11.
C2050		.8	7.0		26.3	245.0	35	1	27.		20.6	8.
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.8	15.0	5	1	5.		.8	
C2160		.1	1.0		4.9	70.0	70	1	63.		4.4	7.
C2230		.0	1.0		.1	6.0	6	1	6.		.1	
C2250		.2	2.0		5.3	70.0	35	1	30.		4.6	5.
C2310		.7	2.0		23.8	70.0	35	1	28.		18.9	7.

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 85.0 PCT OR 18374.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 18306.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C3020		1.0	16.0		486.1	7856.0	491	1	378.		373.8	113.
C4000		6.3	80.0		100.8	1280.0	16	1	16.		100.8	
C4010		2.0	50.0		26.0	650.0	13	1	13.		26.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		68.5	840.0	21	1	20.		64.8	1.
C4140		.5	10.0		3.4	70.0	7	1	7.		3.4	
C4230		.7	45.0		3.4	225.0	5	1	5.		3.4	
C4250		4.2	53.0		21.0	265.0	5	1	5.		21.0	
C4340		11.0	64.0		44.0	255.0	4	1	4.		44.0	
C4390		7.7	60.0		15.3	120.0	2	1	2.		15.3	
C4436		.0	1.0		6.4	638.0	638	1	638.		6.4	
C4640		72.0	918.0		72.0	918.0	1	8	1.		72.0	
C4650		3.0	85.0		18.0	510.0	6	1	6.		18.0	
C4660		12.0	204.0		60.0	1020.0	5	1	5.		60.0	
C4670		1.4	6.0		2.8	12.0	2	1	2.		2.8	
C4680		.2	2.0		.5	6.0	3	1	3.		.5	
C4690		2.0	40.0		50.7	1040.0	26	1	21.		41.7	5.
C4790		7.7	40.0		192.2	1000.0	25	1	18.		141.5	7.
C4820		15.0	150.0		270.0	2700.0	18	1	16.		240.0	2.
C4830		.1	50.0		.8	750.0	15	1	15.		.8	
C4870		6.4	85.0		101.9	1360.0	16	1	16.		101.9	
C4880		3.6	8.0		213.6	480.0	60	1	41.		146.6	19.
C4980		14.0	150.0		476.0	5100.0	34	1	20.		276.6	14.
C5070		4.2	74.0		8.4	148.0	2	1	2.		8.4	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5090		4.0	196.0		12.1	588.0	3	1	3.		12.1	
C5110		2.7	14.0		93.1	490.0	35	1	25.		65.7	10.
C5200		3.8	4.0		264.6	280.0	70	1	48.		180.5	22.
C5300		.1	1.0		2.2	44.0	44	1	44.		2.2	
C5310		66.0	1012.0		66.0	1012.0	1	1	1.		66.0	
C5320		8.2	162.0		709.9	14094.0	87	1	54.		443.8	33.
C5330		6.6	86.0		6.6	86.0	1	1	1.		6.6	
C5340		8.6	95.0		42.7	475.0	5	1	5.		42.7	
C5370		145.0	2375.0		1740.0	28500.0	12	1	7.		991.0	5.
C5380		101.0	1306.0		101.0	1306.0	1	1	1.		101.0	
C5390		46.7	756.0		46.7	756.0	1	1	1.		46.7	
C5400		7.0	150.0		577.7	12450.0	83	1	53.		368.3	30.
C5410		9.0	131.0		90.0	1310.0	10	1	10.		90.0	
C5420		25.0	353.0		725.0	10237.0	29	1	15.		332.6	14.
C5830		.9	10.0		21.6	240.0	24	1	23.		20.4	1.
C5870		4.3	38.0		34.2	304.0	8	1	8.		34.2	
C5910		15.0	1360.0		30.0	2720.0	2	1	2.		30.0	

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 85.0 PCT OR 18374.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 18306.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFIC-IENCY
C5920		11.0	920.0		99.0	8280.0	9	1	9.		99.0	
C5930		2.8	100.0		162.8	5900.0	59	1	42.		114.6	17.
C5990		1.5	31.0		4.3	93.0	3	1	3.		4.3	
C6000		4.0	134.0		4.0	134.0	1	1	1.		4.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6140		.2	7.0		1.1	42.0	6	1	6.		1.1	
C6150		4.0	138.0		4.0	138.0	1	1	1.		4.0	
C6220		.5	7.0		5.5	77.0	11	1	11.		5.5	
C6260		11.0	5.0		66.0	30.0	6	1	6.		66.0	
C6350		21.0	230.0		126.0	1380.0	6	1	6.		126.0	
C6370		6.3	107.0		157.5	2675.0	25	1	19.		118.8	6.
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		452.3	16191.0	63	1	40.		287.3	23.
C6410		18.0	330.0		774.0	14190.0	43	1	24.		432.5	19.
C6420		119.0	2148.0		238.0	4296.0	2	1	2.		238.0	
C6490		1.5	62.0		34.5	1426.0	23	1	22.		32.4	1.
C6510		6.9	90.0		27.5	360.0	4	1	4.		27.5	
C6650		50.0	300.0		100.0	600.0	2	1	2.		100.0	
C6660		3.2	30.0		47.4	450.0	15	1	15.		47.4	
C6670		.9	18.0		38.0	720.0	40	1	31.		29.3	9.
C6680		1.0	25.0		2.0	50.0	2	1	2.		2.0	
C6684		.0	1.0		3.3	327.0	327	1	327.		3.3	
D0070		1.4	28.0		2.8	56.0	2	2	2.		2.8	
D0090	38.0		1054.0	76.0		2108.0	2	4	2.	76.0		
D0100		20.0	163.0		40.0	326.0	2	2	2.		40.0	
D0170		4.0	517.0		16.0	2068.0	4	1	4.		16.0	
D0190	119.0		5855.0	119.0		5855.0	1	2	1.	119.0		
D0390		1.4	21.0		2.7	42.0	2	2	2.		2.7	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		1.2	32.0	2	2	2.		1.2	
D0420		.7	11.0		1.4	22.0	2	2	2.		1.4	
D0725		125.0	1832.0		250.0	3664.0	2	2	2.		250.0	
D0730		29.0	660.0		87.0	1980.0	3	2	3.		87.0	
D0740		35.8	710.0		107.4	2130.0	3	2	3.		107.4	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		362.8	7560.0	4	2	4.		362.8	
D0840	46.0		570.0	2622.0		32490.0	57	4	49.	2239.9		8.
D0860	96.0		2750.0	2688.0		77000.0	28	4	23.	2194.8		5.
D0880	93.0		2710.0	465.0		13550.0	5	4	4.	419.2		1.
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1020	134.0		7370.0	1608.0		88440.0	12	4	9.	1144.4		3.
D1040	176.0		[illegible]	4224.0		[illegible]	24	4	19.	[illegible]		5.

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 85.0 PCT OR 18374.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 18306.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
D1060	256.0		22960.0	768.0		68880.0	3	4	3.	737.0		
D1160	61.0		2400.0	4026.0		158400.0	66	4	55.	3395.4		11.
D1210	239.0		34250.0	239.0		34250.0	1	2	1.	239.0		
D1250		.0	2.0		.1	8.0	4	1	4.		.1	
E0050		12.0	3.0		324.0	81.0	27	1	16.		192.5	11.
E0070		39.0	7.0		858.0	154.0	22	1	14.		532.3	8.
E0210		.0	1.0		.1	11.0	11	1	11.		.1	
E0320		8.9	108.0		35.7	432.0	4	2	4.		35.7	
E0980		3.0	89.0		20.7	623.0	7	2	7.		20.7	
E0990		1.3	24.0		7.8	144.0	6	4	6.		7.8	
E1155		0.0	0.0		0.0	0.0	8	2	8.		0.0	
E1156		0.0	0.0		0.0	0.0	2	2	2.		0.0	
E1240		.0	1.0		.0	1.0	1	4	1.		.0	
E1403		.0	2.0		.1	4.0	2	2	2.		.1	
E1760		.3	8.0		1.9	48.0	6	2	6.		1.9	
E1900		1.0	5.0		2.0	10.0	2	8	2.		2.0	
E2030		1.1	39.0		2.3	78.0	2	2	2.		2.3	
GRAND TOTALS				21537.0	21616.3	1316058.0	3625		3165.	18306.0	18374.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 87.76
OR INDEX(CUBE) = 92.73
OR INDEX(TOTAL T/E) = 91.78

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 75.0 PCT OR 16212.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 16153.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0005		5.0	159.0		15.0	477.0	3	8	3.		15.0	
A0030		3.0	47.0		36.0	564.0	12	3	12.		[illegible]	
A0130		1.0	3.0		2.0	6.0	2	4	2.		2.0	
A0240	162.0		8100.0	162.0		8100.0	1	8	1.	162.0		
A0265		0.0	0.0		0.0	0.0	2	8	2.		0.0	
A0270	41.0		1975.0	205.0		9875.0	5	8	5.	205.0		
A0320		1.0	20.0		25.0	500.0	25	8	25.		25.0	
A0328		1.0	9.0		10.0	90.0	10	8	10.		10.0	
A0490		1.0	12.0		10.0	120.0	10	8	10.		10.0	
A0660		1.0	42.0		2.0	84.0	2	4	2.		2.0	
A0685		0.0	0.0		0.0	0.0	1	4	1.		0.0	
A0710		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A0730		3.0	96.0		6.0	192.0	2	4	2.		6.0	
A0800		5.0	94.0		5.0	94.0	1	4	1.		5.0	
A0810		4.0	115.0		8.0	230.0	2	8	2.		8.0	
A0870		7.0	182.0		21.0	546.0	3	8	3.		21.0	
A0912		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A1180		1.0	26.0		3.0	78.0	3	4	3.		3.0	
A1190		4.0	104.0		8.0	208.0	2	4	2.		8.0	
A1250		1.0	10.0		4.0	40.0	4	4	4.		4.0	
A1290		36.0	1122.0		72.0	2244.0	2	8	2.		72.0	
A1300		7.0	523.0		14.0	1046.0	2	8	2.		14.0	
A1420		11.0	93.0		22.0	186.0	2	8	2.		22.0	
A1570		1.0	45.0		1.0	45.0	1	8	1.		1.0	
A1630		1.0	33.0		2.0	66.0	2	8	2.		2.0	
A1730		1.0	22.0		25.0	550.0	25	8	25.		25.0	
A1800		1.0	56.0		14.0	784.0	14	8	14.		14.0	
A1890		1242.0	9950.0		3726.0	29850.0	3	8	2.		2640.8	1.
A1900	70.0		4190.0	1050.0		62850.0	15	8	13.	938.3		2.
A1920	61.0		2535.0	366.0		15210.0	6	8	6.	365.4		
A1930	60.0		2670.0	360.0		16020.0	6	8	6.	359.6		
A1940		350.0	2575.0		5250.0	38625.0	15	8	15.		5250.0	
A1950		-0.0	0.0		0.0	0.0	2	8	2.		0.0	
A2010		8.0	101.0		64.0	808.0	8	8	8.		64.0	
A2020		8.0	139.0		128.0	2224.0	16	8	16.		128.0	
A2040		1.0	23.0		8.0	184.0	8	8	8.		8.0	
A2050		1.0	20.0		44.0	880.0	44	8	44.		44.0	
A2182	60.0		3370.0	240.0		13480.0	4	8	4.	240.0		
A2183	60.0		2761.0	1560.0		71786.0	26	8	22.	1292.1		4.
A2184		2.0	55.0		16.0	440.0	8	8	8.		16.0	
A2220		2.0	82.0		18.0	738.0	9	8	9.		18.0	
A2270		2.0	38.0		36.0	684.0	18	8	18.		36.0	
A2310	88.0		3300.0	264.0		9900.0	3	8	3.	264.0		

NOTE:

Unit = M1988
Constraint = 75%

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 75.0 PCT OR 16212.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 16153.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A2320	88.0		3100.0	176.0		6200.0	2	4	2.	176.0		
A2340	88.0		4750.0	88.0		4750.0	1	4	1.	88.0		
A2350	80.0		4750.0	80.0		4750.0	1	4	1.	80.0		
A2480		1.0	28.0		14.0	392.0	14	8	14.		14.0	
A2500		10.0	262.0		30.0	786.0	3	8	3.		30.0	
A2510		53.0	145.0		106.0	290.0	2	4	2.		106.0	
A2660		5.0	90.0		40.0	720.0	8	8	8.		40.0	
A2685		1.0	10.0		28.0	280.0	28	8	28.		28.0	
A2700		1.0	20.0		2.0	40.0	2	4	2.		2.0	
A2710		1.0	25.0		4.0	100.0	4	4	4.		4.0	
A2920		10.0	115.0		10.0	115.0	1	4	1.		10.0	
A3012		0.0	0.0		0.0	0.0	2	2	2.		0.0	
A3060		10.0	42.0		10.0	42.0	1	4	1.		10.0	
A3065		1.0	15.0		1.0	15.0	1	4	1.		1.0	
A3238		2.0	21.0		12.0	126.0	6	8	6.		12.0	
A3280		1.0	15.0		3.0	45.0	3	4	3.		3.0	
B0001	5.0		200.0	10.0		400.0	2	4	2.	10.0		
B0003	2.0		265.0	16.0		2120.0	8	4	7.	13.7		1.
B0011		0.0	0.0		0.0	0.0	4	1	4.		0.0	
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0470		6.9	130.0		41.2	780.0	6	2	6.		41.2	
B0490		29.0	312.0		29.0	312.0	1	8	1.		29.0	
B0500		8.1	225.0		8.1	225.0	1	4	1.		8.1	
B1360		8.0	255.0		32.0	1020.0	4	4	4.		32.0	
B1430		7.5	138.0		30.0	552.0	4	8	4.		30.0	
B1440		31.0	407.0		31.0	407.0	1	8	1.		31.0	
B1445		0.0	0.0		0.0	0.0	1	8	1.		0.0	
B1620		10.0	220.0		10.0	220.0	1	4	1.		10.0	
B1755		74.0	4471.0		74.0	4471.0	1	8	1.		74.0	
B2080		.4	9.0		2.3	54.0	6	8	6.		2.3	
B2220		4.2	140.0		4.2	140.0	1	4	1.		4.2	
B2390		6.5	100.0		6.5	100.0	1	2	1.		6.5	
C2010		.3	4.0		10.8	140.0	35	1	28.		8.8	7.
C2030		.5	6.0		16.8	210.0	35	1	27.		13.2	8.
C2040		.3	3.0		18.9	210.0	70	1	57.		15.4	13.
C2050		.8	7.0		26.3	245.0	35	1	27.		19.9	8.
C2060		.0	1.0		.0	4.0	4	1	4.		.0	
C2070		1.9	60.0		14.8	480.0	8	1	8.		14.8	
C2100		.2	3.0		.8	15.0	5	1	5.		.8	
C2160		.1	1.0		4.9	70.0	70	1	62.		4.3	8.
C2230		.0	1.0		.1	6.0	6	1	6.		.1	
C2250		.2	2.0		5.3	70.0	35	1	30.		4.5	5.
C2310		.7	2.0		24.[illegible]	70.0	35	1	27.		18.2	8.

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 75.0 PCT OR 16212.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 16153.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E**** CUBE	DEFIC-IENCY
C3020		1.0	16.0		486.1	7856.0	491	1	364.		360.7	127.
C4000		6.3	80.0		100.8	1280.0	16	1	15.		100.8	
C4010		2.0	50.0		26.0	650.0	13	1	13.		26.0	
C4015		1.3	27.0		1.3	27.0	1	1	1.		1.3	
C4020		.1	5.0		.6	40.0	8	1	8.		.6	
C4040		3.3	40.0		68.5	840.0	21	1	19.		61.1	2.
C4140		.5	10.0		3.4	70.0	7	1	7.		3.4	
C4230		.7	45.0		3.4	225.0	5	1	5.		3.4	
C4250		4.2	53.0		21.0	265.0	5	1	5.		21.0	
C4340		11.0	64.0		44.0	256.0	4	1	4.		44.0	
C4390		7.7	60.0		15.3	120.0	2	1	2.		15.3	
C4436		.0	1.0		6.4	638.0	638	1	638.		6.4	
C4640		72.0	918.0		72.0	918.0	1	8	1.		72.0	
C4650		3.0	85.0		18.0	510.0	6	1	6.		18.0	
C4660		12.0	204.0		60.0	1020.0	5	1	5.		60.0	
C4670		1.4	6.0		2.8	12.0	2	1	2.		2.8	
C4680		.2	2.0		.5	6.0	3	1	3.		.5	
C4690		2.0	40.0		50.7	1040.0	26	1	20.		39.0	6.
C4790		7.7	40.0		192.2	1000.0	25	1	17.		132.8	8.
C4820		15.0	150.0		270.0	2700.0	18	1	15.		219.0	3.
C4830		.1	50.0		.8	750.0	15	1	15.		.8	
C4870		6.4	85.0		101.9	1360.0	16	1	16.		101.9	
C4880		3.6	8.0		213.6	480.0	60	1	39.		140.3	21.
C4980		14.0	150.0		476.0	5100.0	34	1	18.		258.9	16.
C5070		4.2	74.0		8.4	148.0	2	1	2.		8.4	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5090		4.0	196.0		12.1	588.0	3	1	3.		12.1	
C5110		2.7	14.0		93.1	490.0	35	1	24.		63.1	11.
C5200		3.8	4.0		264.6	280.0	70	1	46.		172.6	24.
C5300		.1	1.0		2.2	44.0	44	1	40.		2.0	4.
C5310		66.0	1012.0		66.0	1012.0	1	1	1.		66.0	
C5320		8.2	162.0		709.9	14094.0	87	1	52.		420.2	35.
C5330		6.6	86.0		6.6	86.0	1	1	1.		6.6	
C5340		8.6	95.0		42.7	475.0	5	1	5.		42.7	
C5370		145.0	2375.0		1740.0	28500.0	12	1	2.		219.7	10.
C5380		101.0	1306.0		101.0	1306.0	1	1	1.		101.0	
C5390		46.7	756.0		46.7	756.0	1	1	1.		46.7	
C5400		7.0	150.0		577.7	12450.0	83	1	50.		349.5	33.
C5410		9.0	131.0		90.0	1310.0	10	1	10.		90.0	
C5820		25.0	353.0		725.0	10237.0	29	1	14.		351.2	15.
C5830		.9	10.0		21.6	240.0	24	1	22.		19.5	2.
C5870		4.3	38.0		34.2	304.0	8	1	8.		34.2	
C5910		15.0	1350.0		30.0	2700.0	2	1	2.		30.0	

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 75.0 PCT OR 16212.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 16153.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C5920		11.0	920.0		99.0	8280.0	9	1	9.		99.0	
C5930		2.8	100.0		162.8	5900.0	59	1	40.		109.9	19.
C5990		1.5	31.0		4.3	93.0	3	1	3.		4.3	
C6000		4.0	134.0		4.0	134.0	1	1	1.		4.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6140		.2	7.0		1.1	42.0	6	1	6.		1.1	
C6150		4.0	138.0		4.0	138.0	1	1	1.		4.0	
C6220		.5	7.0		5.5	77.0	11	1	11.		5.5	
C6260		11.0	5.0		66.0	30.0	6	1	6.		66.0	
C6350		21.0	230.0		126.0	1380.0	6	1	6.		126.0	
C6370		6.3	107.0		157.5	2675.0	25	1	18.		111.9	7.
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		452.3	16191.0	63	1	38.		272.5	25.
C6410		18.0	330.0		774.0	14190.0	43	1	22.		401.8	21.
C6420		119.0	2148.0		238.0	4296.0	2	1	2.		238.0	
C6490		1.5	62.0		34.5	1426.0	23	1	21.		30.9	2.
C6510		6.9	90.0		27.5	360.0	4	1	4.		27.5	
C6650		50.0	300.0		100.0	600.0	2	1	2.		100.0	
C6660		3.2	30.0		47.4	450.0	15	1	15.		47.4	
C6670		.9	18.0		38.0	720.0	40	1	30.		28.3	10.
C6680		1.0	25.0		2.0	50.0	2	1	2.		2.0	
C6684		.0	1.0		3.3	327.0	327	1	327.		3.3	
D0070		1.4	28.0		2.8	56.0	2	2	2.		2.8	
D0090	38.0		1054.0	76.0		2108.0	2	4	2.	76.0		
D0100		20.0	163.0		40.0	326.0	2	2	2.		40.0	
D0170		4.0	517.0		16.0	2068.0	4	1	4.		16.0	
D0190	119.0		5855.0	119.0		5855.0	1	2	1.	119.0		
D0390		1.4	21.0		2.7	42.0	2	2	2.		2.7	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		1.2	32.0	2	2	2.		1.2	
D0420		.7	11.0		1.4	22.0	2	2	2.		1.4	
D0725		125.0	1832.0		250.0	3664.0	2	2	2.		250.0	
D0730		29.0	660.0		87.0	1980.0	3	2	3.		87.0	
D0740		35.8	710.0		107.4	2130.0	3	2	3.		107.4	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0765		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		362.8	7560.0	4	2	4.		362.8	
D0840	46.0		570.0	2622.0		32490.0	57	4	42.	1943.6		15.
D0860	96.0		2750.0	2688.0		77000.0	28	4	19.	1863.1		9.
D0880	93.0		2710.0	465.0		13550.0	5	4	4.	365.8		1.
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1020	134.0		7370.0	1608.0		88440.0	12	4	7.	976.4		5.
D1030	176.0		13660.0	4224.0		327840.0	24	4	16.	2744.1		8.

CONSTRAINED T/E FOR UNIT M1988

HEADQUARTERS BATTALION, MARINE DIVISION

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 21616.34 CU FT
CONSTRAINED TO 75.0 PCT OR 16212.00 CU FT

SQUARE OF PUBLISHED T/E IS 21537.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 16153.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D1060	256.0		22960.0	768.0		68880.0	3	4	2.	620.0		1.
D1160	61.0		2400.0	4026.0		158400.0	66	4	48.	2912.7		18.
D1210	239.0		34250.0	239.0		34250.0	1	2	1.	213.2		
D1250		.0	2.0		.1	8.0	4	1	4.		.1	
E0040		12.0	3.0		324.0	81.0	27	1	15.		180.8	12.
E0090		39.0	7.0		858.0	154.0	22	1	12.		449.3	10.
E0210		.0	1.0		.1	11.0	11	1	11.		.1	
E0320		8.9	108.0		35.7	432.0	4	2	4.		35.7	
E0980		3.0	89.0		20.7	623.0	7	2	7.		20.7	
E0990		1.3	24.0		7.8	144.0	6	4	6.		7.8	
E1155		0.0	0.0		0.0	0.0	8	2	8.		0.0	
E1156		0.0	0.0		0.0	0.0	2	2	2.		0.0	
E1240		.0	1.0		.0	1.0	1	4	1.		.0	
E1403		.0	2.0		.1	4.0	2	2	2.		.1	
E1760		.3	8.0		1.9	48.0	6	2	6.		1.9	
E1900		1.0	5.0		2.0	10.0	2	8	2.		2.0	
E2030		1.1	39.0		2.3	78.0	2	2	2.		2.3	
GRAND TOTALS				21537.0	21616.3	1316058.0	3625		3078.	16153.0	16212.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 79.80
OR INDEX(CUBE) = 91.57
OR INDEX(TOTAL T/E) = 89.31

CONSTRAINED T/E FOR UNIT M8615

H+HS, MACG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 85.0 PCT OR 4600.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 6206.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
A2710		1.0	25.0		1.0	25.0	1	4	1.		1.0	
B0090		4.0	110.0		4.0	110.0	1	4	1.		4.0	
B0390	143.0		9525.0	143.0		9525.0	1	2	1.	141.6		
B1540		1.0	116.0		2.0	232.0	2	8	2.		2.0	
B2060	20.0		690.0	20.0		690.0	1	2	1.	20.0		
B2155		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B2280		4.8	133.0		19.0	532.0	4	2	4.		19.0	
B2290		4.3	98.0		17.3	392.0	4	2	4.		17.3	
B2390		6.5	100.0		13.1	200.0	2	2	2.		13.1	
B2680	83.0		3100.0	166.0		6200.0	2	2	2.	156.9		
C2000		.0	1.0		.0	2.0	2	1	2.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		1.0	25.0	5	1	5.		1.0	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C4010		2.0	50.0		12.0	300.0	6	1	6.		12.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		9.8	120.0	3	1	3.		9.8	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4240		3.4	52.0		3.4	52.0	1	1	1.		3.4	
C4250		4.2	53.0		21.0	265.0	5	1	5.		21.0	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4436		.0	1.0		2.0	200.0	200	1	200.		2.0	
C4630		13.0	200.0		26.0	400.0	2	2	2.		26.0	
C4660		12.0	204.0		24.0	408.0	2	1	2.		24.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		3.9	80.0	2	1	2.		3.9	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		315.0	3150.0	21	1	19.		291.7	2.
C4870		6.4	85.0		210.2	2805.0	33	1	24.		150.3	9.
C4880		3.6	8.0		53.4	120.0	15	1	15.		53.4	
C4900		124.0	[illegible]		[illegible]	1800.0	3	1	3.		372.0	

NOTE:

Unit = M8615

Constraint = 90%

CONSTRAINED T/E FOR UNIT M8615

H+HS, MACG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 85.0 PCT OR 4600.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 6205.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFIC-IENCY
C4950		3.9	95.0		11.8	285.0	3	1	3.		11.8	
C5020		3.0	207.0		9.0	621.0	3	1	3.		9.0	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		26.6	140.0	10	1	10.		26.6	
C5200		3.8	4.0		151.2	160.0	40	1	30.		113.5	10.
C5310		66.0	1012.0		66.0	1012.0	1	1	1.		66.0	
C5320		8.2	162.0		367.2	7290.0	45	1	31.		256.2	14.
C5370		145.0	2375.0		145.0	2375.0	1	1	1.		145.0	
C5400		7.0	150.0		292.3	6300.0	42	1	30.		207.3	12.
C5410		9.0	131.0		54.0	786.0	6	1	6.		54.0	
C5830		.9	10.0		1.8	20.0	2	1	2.		1.8	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5900		38.0	642.0		38.0	642.0	1	1	1.		38.0	
C5920		11.0	920.0		22.0	1840.0	2	1	2.		22.0	
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5940		2.0	25.0		2.0	25.0	1	1	1.		2.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6130		6.3	246.0		12.6	492.0	2	1	2.		12.6	
C6220		.5	5.0		3.0	30.0	6	1	6.		3.0	
C6250		84.1	1254.0		168.2	2508.0	2	1	2.		168.2	
C6260		11.0	150.0		66.0	900.0	6	1	6.		66.0	
C6280		2.1	144.0		2.1	144.0	1	1	1.		2.1	
C6290		.1	4.0		.7	24.0	6	1	6.		.7	
C6370		6.3	107.0		12.6	214.0	2	1	2.		12.6	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		114.9	4112.0	16	1	16.		114.9	
C6410		18.0	330.0		1350.0	24750.0	75	1	48.		862.9	27.
C6420		119.0	2148.0		714.0	12888.0	6	1	6.		714.0	
C6490		1.5	62.0		42.0	1736.0	29	1	23.		33.0	5.
C6520		.9	35.0		.9	35.0	1	1	1.		.9	
C6550		.5	21.0		.5	21.0	1	1	1.		.5	
C6590		31.0	600.0		31.0	600.0	1	1	1.		31.0	
C6630		2.0	71.0		6.0	213.0	3	1	3.		6.0	
C6650		50.0	300.0		100.0	600.0	2	1	2.		100.0	
C6655		.1	1.0		.8	15.0	15	1	15.		.8	
C6658		.1	1.0		.2	4.0	4	1	4.		.2	
C6670		.9	18.0		4.7	90.0	5	1	5.		4.7	
C6684		.0	1.0		.9	90.0	90	1	90.		.9	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		2.3	56.0	2	2	2.		2.8	
D0090	38.0		1054.0	76.0		2108.0	2	4	2.	76.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0140	183.0		16956.0	183.0		16956.0	1	3	1.	183.0		

CONSTRAINED T/E FOR UNIT M8615

H+HS, MACG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 85.0 PCT OR 4600.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 6206.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D0190	119.0		5855.0	119.0		5855.0	1	2	1.	119.0		
D0210		.2	10.0		.2	10.0	1	2	1.		.2	
D0230	331.0		16500.0	331.0		16500.0	1	4	1.	319.8		
D0260	229.0		13500.0	458.0		27000.0	2	2	2.	379.7		
D0310	364.0		35392.0	364.0		35392.0	1	2	1.	300.0		
D0320	182.0		17772.0	182.0		17772.0	1	2	1.	173.0		
D0330	182.0		18030.0	182.0		18030.0	1	2	1.	173.0		
D0450		.9	70.0		.9	70.0	1	2	1.		.9	
D0470		.9	11.0		.9	11.0	1	2	1.		.9	
D0560		.4	30.0		.4	30.0	1	2	1.		.4	
D0575		.1	1.0		.1	1.0	1	2	1.		.1	
D0580		28.0	650.0		28.0	650.0	1	2	1.		28.0	
D0600		28.0	495.0		28.0	495.0	1	2	1.		28.0	
D0680		87.0	1250.0		87.0	1250.0	1	8	1.		87.0	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	184.0		2280.0	4	4	4.	165.4		
D0880	93.0		2710.0	372.0		10840.0	4	8	4.	372.0		
D1030	176.0		13660.0	1408.0		109280.0	8	4	6.	974.0		2.
D1070	190.0		21981.0	380.0		43962.0	2	2	2.	323.8		
D1110	185.0		14970.0	370.0		29940.0	2	8	2.	370.0		
D1120	179.0		14750.0	358.0		29500.0	2	8	2.	358.0		
D1130	181.0		17410.0	543.0		52230.0	3	2	2.	431.1		1.
D1160	61.0		2400.0	488.0		19200.0	8	4	6.	363.2		2.
D1186	124.0		5460.0	496.0		21840.0	4	4	3.	412.9		1.
D1210	239.0		34250.0	478.0		68500.0	2	2	2.	393.7		
E0090		.4	7.0		1.2	21.0	3	1	3.		1.2	
E1760		.3	8.0		6.4	160.0	20	2	20.		6.4	
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
	GRAND TOTALS			7301.0	5412.0	634748.0	922		835.	6206.0	4600.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 87.62
OR INDEX(CUBE) = 91.59
OR INDEX(TOTAL T/E) = 90.86

CONSTRAINED T/E FOR UNIT M8615

H+HS, MACG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 77.5 PCT OR 4194.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 5658.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E***** QTY	SQUARE	CUBE	DEFIC-IENCY
A2710		1.0	25.0		1.0	25.0	1	4	1.		1.0	
B0090		4.0	110.0		4.0	110.0	1	4	1.		4.0	
B0390	143.0		9525.0	143.0		9525.0	1	2	1.	125.4		
B1540		1.0	116.0		2.0	232.0	2	8	2.		2.0	
B2050	20.0		690.0	20.0		690.0	1	2	1.	20.0		
B2155		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B2280		4.8	133.0		19.0	532.0	4	2	4.		19.0	
B2290		4.3	98.0		17.3	392.0	4	2	4.		17.3	
B2390		6.5	100.0		13.1	200.0	2	2	2.		13.1	
B2680	83.0		3100.0	166.0		6200.0	2	2	2.	143.8		
C2000		.0	1.0		.0	2.0	2	1	2.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		1.0	25.0	5	1	5.		1.0	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C4010		2.0	50.0		12.0	300.0	6	1	6.		12.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		9.8	120.0	3	1	3.		9.8	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4240		3.4	52.0		3.4	52.0	1	1	1.		3.4	
C4250		4.2	53.0		21.0	265.0	5	1	5.		21.0	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4436		.0	1.0		2.0	200.0	200	1	200.		2.0	
C4630		13.0	200.0		26.0	400.0	2	2	2.		26.0	
C4660		12.0	204.0		24.0	408.0	2	1	2.		24.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		3.9	80.0	2	1	2.		3.9	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		315.0	3150.0	21	1	15.		227.7	6.
C4870		6.4	85.0		210.2	2805.0	33	1	19.		123.3	14.
C4880		3.6	8.0		53.4	120.0	15	1	15.		53.4	
C4900		124.0	600.0		372.0	1800.0	3	1	3.		372.0	

NOTE:

Unit = M8615

Constraint = 85%

CONSTRAINED T/E FOR UNIT M8615

H+HS. MACG

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 77.5 PCT OR 4194.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 5658.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4960		3.9	95.0		11.8	285.0	3	1	3.		11.8	
C5020		3.0	207.0		9.0	621.0	3	1	3.		9.0	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		26.6	140.0	10	1	10.		26.6	
C5200		3.8	4.0		151.2	160.0	40	1	25.		95.2	15.
C5310		66.0	1012.0		66.0	1012.0	1	1	1.		66.0	
C5320		8.2	162.0		367.2	7290.0	45	1	25.		207.3	20.
C5370		145.0	2375.0		145.0	2375.0	1	1	1.		145.0	
C5400		7.0	150.0		292.3	6300.0	42	1	24.		159.2	18.
C5410		9.0	131.0		54.0	786.0	6	1	6.		54.0	
C5830		.9	10.0		1.8	20.0	2	1	2.		1.8	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5900		38.0	642.0		38.0	642.0	1	1	1.		38.0	
C5920		11.0	920.0		22.0	1840.0	2	1	2.		22.0	
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5940		2.0	25.0		2.0	25.0	1	1	1.		2.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6130		6.3	246.0		12.6	492.0	2	1	2.		12.6	
C6220		.5	5.0		3.0	30.0	6	1	6.		3.0	
C6250		84.1	1254.0		168.2	2508.0	2	1	2.		168.2	
C6260		11.0	150.0		66.0	900.0	6	1	6.		66.0	
C6280		2.1	144.0		2.1	144.0	1	1	1.		2.1	
C6290		.1	4.0		.7	24.0	6	1	6.		.7	
C6370		6.3	107.0		12.6	214.0	2	1	2.		12.6	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		114.9	4112.0	16	1	16.		114.9	
C6410		18.0	330.0		1350.0	24750.0	75	1	37.		657.9	38.
C6420		119.0	2148.0		714.0	12888.0	6	1	6.		714.0	
C6490		1.5	62.0		42.0	1736.0	28	1	20.		29.4	8.
C6520		.9	35.0		.9	35.0	1	1	1.		.9	
C6550		.5	21.0		.5	21.0	1	1	1.		.5	
C6590		31.0	600.0		31.0	600.0	1	1	1.		31.0	
C6630		2.0	71.0		6.0	213.0	3	1	3.		6.0	
C6650		50.0	300.0		100.0	600.0	2	1	2.		100.0	
C6655		.1	1.0		.8	15.0	15	1	15.		.8	
C6658		.1	1.0		.2	4.0	4	1	4.		.2	
C6670		.9	18.0		4.7	90.0	5	1	5.		4.7	
C6684		.0	1.0		.9	90.0	90	1	90.		.9	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		2.8	56.0	2	2	2.		2.8	
D0090	38.0		1054.0	76.0		2108.0	2	4	2.	76.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0140	183.0		16956.0	183.0		16956.0	1	8	1.	183.0		

CONSTRAINED T/E FOR UNIT M8615

H+HS. MACG

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 77.5 PCT OR 4194.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 5658.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D0190	119.0		5855.0	119.0		5855.0	1	2	1.	109.7		
D0210		.2	10.0		.2	10.0	1	2	1.		.2	
D0230	331.0		16500.0	331.0		16500.0	1	4	1.	280.2		
D0250	229.0		13500.0	458.0		27000.0	2	2	1.	330.5		1.
D0310	364.0		35392.0	364.0		35392.0	1	2	1.	242.0		
D0320	182.0		17772.0	182.0		17772.0	1	2	1.	150.4		
D0330	182.0		18030.0	182.0		18030.0	1	2	1.	150.4		
D0450		.9	70.0		.9	70.0	1	2	1.		.9	
D0470		.9	11.0		.9	11.0	1	2	1.		.9	
D0560		.4	30.0		.4	30.0	1	2	1.		.4	
D0575		.1	1.0		.1	1.0	1	2	1.		.1	
D0580		28.0	650.0		28.0	650.0	1	2	1.		28.0	
D0600		28.0	495.0		28.0	495.0	1	2	1.		28.0	
D0680		87.0	1250.0		87.0	1250.0	1	8	1.		87.0	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	184.0		2280.0	4	4	3.	155.4		1.
D0880	93.0		2710.0	372.0		10840.0	4	8	4.	372.0		
D1030	176.0		13660.0	1408.0		109280.0	8	4	5.	872.1		3.
D1070	190.0		21981.0	380.0		43962.0	2	2	2.	295.2		
D1110	185.0		14970.0	370.0		29940.0	2	8	2.	370.0		
D1120	179.0		14750.0	358.0		29500.0	2	8	2.	358.0		
D1130	181.0		17410.0	543.0		52230.0	3	2	2.	391.2		1.
D1160	61.0		2400.0	488.0		19200.0	8	4	5.	333.3		3.
D1186	124.0		5460.0	496.0		21840.0	4	4	3.	378.9		1.
D1210	239.0		34250.0	478.0		68500.0	2	2	1.	341.6		1.
E0090		.4	7.0		1.2	21.0	3	1	3.		1.2	
E1750		.3	8.0		6.4	160.0	20	2	20.		6.4	
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				7301.0	5412.0	634748.0	922		793.	5658.0	4194.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 82.91
OR INDEX(CUBE) = 87.43
OR INDEX(TOTAL T/E) = 86.59

CONSTRAINED T/E FOR UNIT M8615

H+HS, MACG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 62.5 PCT OR 3383.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 62.5 PCT OR 4563.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
A2710		1.0	25.0		1.0	25.0	1	4	1.		1.0	
B0090		4.0	110.0		4.0	110.0	1	4	1.		4.0	
B0390	143.0		9525.0	143.0		9525.0	1	2	1.	96.9		
B1540		1.0	116.0		2.0	232.0	2	8	2.		2.0	
B2060	20.0		690.0	20.0		690.0	1	2	1.	20.0		
B2155		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B2280		4.8	133.0		19.0	532.0	4	2	4.		19.0	
B2290		4.3	98.0		17.3	392.0	4	2	4.		17.3	
B2390		6.5	100.0		13.1	200.0	2	2	2.		13.1	
B2680	83.0		3100.0	166.0		6200.0	2	2	1.	116.6		1.
C2000		.0	1.0		.0	2.0	2	1	2.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		1.0	25.0	5	1	5.		1.0	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2150		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C4010		2.0	50.0		12.0	300.0	6	1	6.		12.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		9.8	120.0	3	1	3.		9.8	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4240		3.4	52.0		3.4	52.0	1	1	1.		3.4	
C4250		4.2	53.0		21.0	265.0	5	1	5.		21.0	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4436		.0	1.0		2.0	200.0	200	1	200.		2.0	
C4630		13.0	200.0		26.0	400.0	2	2	2.		26.0	
C4660		12.0	204.0		24.0	408.0	2	1	2.		24.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		3.9	80.0	2	1	2.		3.9	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		315.0	3150.0	21	1	15.		223.9	6.
C4870		6.4	85.0		210.2	2805.0	33	1	21.		130.9	12.
C4880		3.6	8.0		53.4	120.0	15	1	15.		53.4	
C4900		124.0	600.0		372.0	1800.0	3	1	1.		91.7	2.

NOTE:

Unit = M8615

Constraint = 75%

CONSTRAINED T/E FOR UNIT M8615

H+HS. MACG

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 62.5 PCT OR 3383.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 62.5 PCT OR 4563.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC- IENCY
C4960		3.9	95.0		11.8	235.0	3	1	3.		11.8	
C5020		3.0	207.0		9.0	621.0	3	1	3.		9.0	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		26.6	140.0	10	1	10.		26.6	
C5200		3.8	4.0		151.2	160.0	40	1	26.		100.0	14.
C5310		66.0	1012.0		66.0	1012.0	1	1	1.		66.0	
C5320		8.2	162.0		367.2	7290.0	45	1	27.		221.4	18.
C5370		145.0	2375.0		145.0	2375.0	1	1	0.		25.1	1.
C5400		7.0	150.0		292.3	6300.0	42	1	26.		180.0	16.
C5410		9.0	131.0		54.0	786.0	6	1	6.		54.0	
C5830		.9	10.0		1.8	20.0	2	1	2.		1.8	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5900		38.0	642.0		38.0	642.0	1	1	1.		38.0	
C5920		11.0	920.0		22.0	1840.0	2	1	2.		22.0	
C5930		2.8	100.0		22.1	800.0	8	1	8.		22.1	
C5940		2.0	25.0		2.0	25.0	1	1	1.		2.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6130		6.3	246.0		12.6	492.0	2	1	2.		12.6	
C6220		.5	5.0		3.0	30.0	6	1	6.		3.0	
C6250		84.1	1254.0		168.2	2503.0	2	1	2.		168.2	
C6260		11.0	150.0		66.0	900.0	6	1	6.		66.0	
C6280		2.1	144.0		2.1	144.0	1	1	1.		2.1	
C6290		.1	4.0		.7	24.0	6	1	6.		.7	
C6370		6.3	107.0		12.6	214.0	2	1	2.		12.6	
C6388		5.9	140.0		58.7	1400.0	10	1	10.		58.7	
C6390		7.2	257.0		114.9	4112.0	16	1	16.		114.7	
C6410		18.0	330.0		1350.0	24750.0	75	1	40.		717.9	35.
C6420		119.0	2148.0		714.0	12888.0	6	1	2.		216.8	4.
C6490		1.5	62.0		42.0	1736.0	28	1	20.		30.4	8.
C6520		.9	35.0		.9	35.0	1	1	1.		.9	
C6550		.5	21.0		.5	21.0	1	1	1.		.5	
C6590		31.0	600.0		31.0	600.0	1	1	1.		31.0	
C6630		2.0	71.0		6.0	213.0	3	1	3.		6.0	
C6650		50.0	300.0		100.0	600.0	2	1	2.		100.0	
C6655		.1	1.0		.8	15.0	15	1	15.		.8	
C6658		.1	1.0		.2	4.0	4	1	4.		.2	
C6670		.9	18.0		4.7	90.0	5	1	5.		4.7	
C6684		.0	1.0		.9	90.0	90	1	90.		.9	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		2.8	56.0	2	2	2.		2.8	
D0090	38.0		1054.0	76.0		2108.0	2	4	2.	63.7		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0140	183.0		[illegible]	183.0		[illegible]	1	8	1.	183.0		

CONSTRAINED T/E FOR UNIT M8615

H+HS. MACG

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 5412.05 CU FT
CONSTRAINED TO 62.5 PCT OR 3383.00 CU FT

SQUARE OF PUBLISHED T/E IS 7301.00 SQ FT
CONSTRAINED TO 62.5 PCT OR 4563.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D0190	119.0		5855.0	119.0		5855.0	1	2	1.	78.0		
D0210		.2	10.0		.2	10.0	1	2	1.		.2	
D0230	331.0		16500.0	331.0		16500.0	1	4	1.	187.6		
D0260	229.0		13500.0	458.0		27000.0	2	2	1.	232.2		1.
D0310	364.0		35392.0	364.0		35392.0	1	2	0.	194.3		1.
D0320	182.0		17772.0	182.0		17772.0	1	2	1.	92.8		
D0330	182.0		18030.0	182.0		18030.0	1	2	1.	92.8		
D0450		.9	70.0		.9	70.0	1	2	1.		.9	
D0470		.9	11.0		.9	11.0	1	2	1.		.9	
D0560		.4	30.0		.4	30.0	1	2	1.		.4	
D0575		.1	1.0		.1	1.0	1	2	1.		.1	
D0580		28.0	650.0		28.0	650.0	1	2	1.		28.0	
D0600		28.0	495.0		28.0	495.0	1	2	1.		28.0	
D0680		87.0	1250.0		87.0	1250.0	1	8	1.		87.0	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	184.0		2280.0	4	4	3.	138.9		1.
D0880	93.0		2710.0	372.0		10840.0	4	8	4.	349.7		
D1030	176.0		13660.0	1408.0		109280.0	8	4	4.	771.5		4.
D1070	190.0		21981.0	380.0		43962.0	2	2	1.	204.1		1.
D1110	185.0		14970.0	370.0		29940.0	2	8	2.	345.3		
D1120	179.0		14750.0	358.0		29500.0	2	8	2.	335.3		
D1130	181.0		17410.0	543.0		52230.0	3	2	2.	285.7		1.
D1160	61.0		2400.0	488.0		19200.0	8	4	5.	304.8		3.
D1186	124.0		5460.0	496.0		21840.0	4	4	3.	327.4		1.
D1210	239.0		34250.0	478.0		68500.0	2	2	1.	237.5		1.
E0090		.4	7.0		1.2	21.0	3	1	3.		1.2	
E1760		.3	8.0		6.4	160.0	20	2	20.		6.4	
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				7301.0	5412.0	634748.0	922		788.	4563.0	3383.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 73.33
OR INDEX(CUBE) = 87.65
OR INDEX(TOTAL T/E) = 85.00

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 85.0 PCT OR 3298.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 2589.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
B0440	156.0		20700.0	156.0		20700.0	1	2	1.	152.0		
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B2070		1.4	82.0		1.4	82.0	1	2	1.		1.4	
B2550	96.0		3375.0	96.0		3375.0	1	2	1.	96.0		
B2560	135.0		18500.0	405.0		55500.0	3	2	2.	327.3		1.
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		3.1	75.0	15	1	15.		3.1	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		126.7	2048.0	128	1	100.		99.6	28.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		5.4	50.0	5	1	5.		5.4	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4205		.1	50.0		.2	200.0	4	1	4.		.2	
C4208		.1	50.0		6.0	6000.0	120	1	120.		6.0	
C4230		.7	45.0		1.3	90.0	2	1	2.		1.3	
C4250		4.2	53.0		42.0	530.0	10	1	10.		42.0	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	.1.0		1.3	128.0	128	1	128.		1.3	
C4450		53.0	190.0		212.0	760.0	4	1	4.		212.0	
C4555		0.0	0.0		0.0	0.0	18	1	18.		0.0	
C4640		72.0	918.0		72.0	918.0	1	2	1.		72.0	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		24.0	408.0	2	1	2.		24.0	
[illegible]		1.4	6.0		1.4	6.0	1	1	1.		1.4	
[illegible]		.2	2.0		.2	2.0	1	1	1.		.2	

NOTE:

Unit = M8914
Constraint = 90%

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTAIF T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3830.49 CU FT
CONSTRAINED TO 85.0 PCT OR 3298.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 2589.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFIC-IENCY
C4690		2.0	40.0		5.8	120.0	3	1	3.		5.8	
C4750		53.3	633.0		106.6	1266.0	2	1	2.		106.6	
C4790		7.7	40.0		15.4	80.0	2	1	2.		15.4	
C4820		15.0	150.0		300.0	3000.0	20	1	17.		253.3	3.
C4870		6.4	85.0		25.5	340.0	4	1	4.		25.5	
C4880		3.6	8.0		42.7	96.0	12	1	12.		42.7	
C4980		14.0	150.0		140.0	1500.0	10	1	10.		140.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		23.9	126.0	9	1	9.		23.9	
C5200		3.8	4.0		181.4	192.0	48	1	33.		125.5	15.
C5320		8.2	162.0		220.3	4374.0	27	1	17.		140.0	10.
C5330		6.6	86.0		6.6	86.0	1	1	1.		6.6	
C5400		7.0	150.0		69.6	1500.0	10	1	10.		69.6	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5830		.9	10.0		1.8	20.0	2	1	2.		1.8	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		11.0	400.0	4	1	4.		11.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6130		6.3	246.0		6.3	246.0	1	1	1.		6.3	
C6220		.5	5.0		1.5	15.0	3	1	3.		1.5	
C6280		2.1	144.0		8.3	576.0	4	1	4.		8.3	
C6345		.1	1.0		4.2	84.0	84	1	84.		4.2	
C6370		6.3	107.0		31.5	535.0	5	1	5.		31.5	
C6388		5.9	140.0		70.4	1680.0	12	1	12.		70.4	
C6410		18.0	330.0		864.0	15840.0	48	1	27.		492.5	21.
C6420		119.0	2148.0		595.0	10740.0	5	1	5.		595.0	
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		2.3	45.0	45	1	45.		2.3	
C6658		.1	1.0		.3	5.0	5	1	5.		.3	
C6684		.0	1.0		.6	60.0	60	1	60.		.6	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	4	1.	125.0		
D0100		20.0	163.0		40.0	326.0	2	2	2.		40.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 85.0 PCT OR 3298.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 2589.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	138.0		1710.0	3	4	3.	133.0		
D0880	93.0		2710.0	186.0		5420.0	2	4	2.	186.0		
D0885	61.0		500.0	122.0		1000.0	2	4	2.	122.0		
D1030	176.0		13660.0	704.0		54640.0	4	4	3.	557.5		1.
D1160	61.0		2400.0	488.0		19200.0	8	4	6.	353.7		2.
D1186	124.0		5460.0	496.0		21840.0	4	4	3.	405.5		1.
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
	GRAND TOTALS			3046.0	3880.5	255202.0	994		913.	2589.0	3298.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 84.85
OR INDEX(CUBE) = 92.15
OR INDEX(TOTAL T/E) = 91.41

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 77.5 PCT OR 3007.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 2361.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
B0440	156.0		20700.0	156.0		20700.0	1	2	1.	129.2		
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	54.0		
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	74.2		
B2070		1.4	82.0		1.4	82.0	1	2	1.		1.4	
B2550	96.0		3375.0	96.0		3375.0	1	2	1.	89.4		
B2560	135.0		18500.0	405.0		55500.0	3	2	2.	287.4		1.
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		3.1	75.0	15	1	15.		3.1	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		126.7	2048.0	128	1	96.		95.1	32.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		5.4	50.0	5	1	5.		5.4	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4205		.1	50.0		.2	200.0	4	1	4.		.2	
C4208		.1	50.0		6.0	6000.0	120	1	109.		5.5	11.
C4230		.7	45.0		1.3	90.0	2	1	2.		1.3	
C4250		4.2	53.0		42.0	530.0	10	1	10.		42.0	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		1.3	128.0	128	1	128.		1.3	
C4450		53.0	190.0		212.0	760.0	4	1	4.		212.0	
C4555		0.0	0.0		0.0	0.0	18	1	18.		0.0	
C4640		72.0	918.0		72.0	918.0	1	2	1.		72.0	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		24.0	408.0	2	1	2.		24.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	

NOTE:

Unit = M8914

Constraint = 85%

CONSTRAINED T/E FOR UNIT M8914

H+MS. (MAG VH) MAW. FMF

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 77.5 PCT OR 3007.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 2361.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E***** CUBE	DEFIC-IENCY
C4690		2.0	40.0		5.8	120.0	3	1	3.		5.8	
C4760		53.3	633.0		106.6	1266.0	2	1	2.		106.6	
C4790		7.7	40.0		15.4	80.0	2	1	2.		15.4	
C4820		15.0	150.0		300.0	3000.0	20	1	15.		225.3	5.
C4870		6.4	85.0		25.5	340.0	4	1	4.		25.5	
C4880		3.6	8.0		42.7	96.0	12	1	12.		42.7	
C4980		14.0	150.0		140.0	1500.0	10	1	10.		140.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		23.9	126.0	9	1	9.		23.9	
C5200		3.8	4.0		181.4	192.0	48	1	32.		120.4	16.
C5320		8.2	162.0		220.3	4374.0	27	1	16.		133.3	11.
C5330		6.6	86.0		6.6	86.0	1	1	1.		6.6	
C5400		7.0	150.0		69.6	1500.0	10	1	10.		69.6	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5830		.9	10.0		1.8	20.0	2	1	2.		1.8	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		11.0	400.0	4	1	4.		11.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6130		6.3	246.0		6.3	246.0	1	1	1.		6.3	
C6220		.5	5.0		1.5	15.0	3	1	3.		1.5	
C6280		2.1	144.0		8.3	576.0	4	1	4.		8.3	
C6345		.1	1.0		4.2	84.0	84	1	77.		3.8	7.
C6370		6.3	107.0		31.5	535.0	5	1	5.		31.5	
C6388		5.9	140.0		70.4	1680.0	12	1	12.		70.4	
C6410		18.0	330.0		864.0	15840.0	48	1	26.		462.0	22.
C6420		119.0	2148.0		595.0	10740.0	5	1	3.		379.0	2.
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		2.3	45.0	45	1	41.		2.1	4.
C6658		.1	1.0		.3	5.0	5	1	5.		.3	
C6684		.0	1.0		.6	60.0	60	1	60.		.6	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	4	1.	125.0		
D0100		20.0	163.0		40.0	326.0	2	2	2.		40.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 77.5 PCT OR 3007.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 2361.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
00740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
00770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
00840	46.0		570.0	138.0		1710.0	3	4	3.	124.0		
00880	93.0		2710.0	186.0		5420.0	2	4	2.	171.4		
00885	61.0		500.0	122.0		1000.0	2	4	2.	118.7		
01030	176.0		13660.0	704.0		54640.0	4	4	3.	498.2		1.
01150	61.0		2400.0	488.0		19200.0	8	4	5.	321.9		3.
01185	124.0		5460.0	496.0		21840.0	4	4	3.	367.7		1.
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				3046.0	3880.5	255202.0	994		878.	2361.0	3007.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 78.14
OR INDEX(CUBE) = 88.77
OR INDEX(TOTAL T/E) = 87.70

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 62.5 PCT OR 2425.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 62.5 PCT OR 1904.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
B0440	156.0		20700.0	156.0		20700.0	1	2	1.	82.9		
B0465	54.0		2641.0	54.0		2641.0	1	2	1.	44.0		
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	55.6		
B2070		1.4	82.0		1.4	82.0	1	2	1.		1.4	
B2550	96.0		3375.0	96.0		3375.0	1	2	1.	64.5		
B2560	135.0		18500.0	405.0		55500.0	3	2	2.	219.4		1.
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		3.1	75.0	15	1	15.		3.1	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		126.7	2048.0	128	1	87.		85.9	41.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		5.4	50.0	5	1	5.		5.4	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4205		.1	50.0		.2	200.0	4	1	4.		.2	
C4208		.1	50.0		6.0	6000.0	120	1	103.		5.1	17.
C4230		.7	45.0		1.3	90.0	2	1	2.		1.3	
C4250		4.2	53.0		42.0	530.0	10	1	10.		42.0	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		1.3	128.0	128	1	128.		1.3	
C4450		53.0	190.0		212.0	760.0	4	1	3.		182.4	
C4555		0.0	0.0		0.0	0.0	18	1	18.		0.0	
C4640		72.0	918.0		72.0	918.0	1	2	1.		72.0	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		24.0	408.0	2	1	2.		24.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	

NOTE:

Unit = M891

1. Constraint

CONSTRAINED T/E FOR UNIT M8914

H+MS. (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3830.49 CU FT
CONSTRAINED TO 62.5 PCT OR 2425.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 62.5 PCT OR 1904.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4690		2.0	40.0		5.8	120.0	3	1	3.		5.8	
C4760		53.3	633.0		106.6	1266.0	2	1	2.		106.6	
C4790		7.7	40.0		15.4	80.0	2	1	2.		15.4	
C4820		15.0	150.0		300.0	3000.0	20	1	12.		180.0	8.
C4870		6.4	85.0		25.5	340.0	4	1	4.		25.5	
C4880		3.6	8.0		42.7	96.0	12	1	12.		42.7	
C4980		14.0	150.0		140.0	1500.0	10	1	10.		140.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		23.9	126.0	9	1	9.		23.9	
C5200		3.8	4.0		181.4	192.0	48	1	27.		103.8	21.
C5320		8.2	162.0		220.3	4374.0	27	1	13.		109.7	14.
C5330		6.6	86.0		6.6	86.0	1	1	1.		6.6	
C5400		7.0	150.0		69.6	1500.0	10	1	10.		69.6	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5830		.9	10.0		1.8	20.0	2	1	2.		1.8	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		11.0	400.0	4	1	4.		11.0	
C6030		.1	3.0		.1	3.0	1	1	1.		.1	
C6130		6.3	246.0		6.3	246.0	1	1	1.		6.3	
C6220		.5	5.0		1.5	15.0	3	1	3.		1.5	
C6280		2.1	144.0		8.3	576.0	4	1	4.		8.3	
C6345		.1	1.0		4.2	84.0	84	1	72.		3.6	12.
C6370		6.3	107.0		31.5	535.0	5	1	5.		31.5	
C6388		5.9	140.0		70.4	1680.0	12	1	12.		70.4	
C6410		18.0	330.0		864.0	15840.0	48	1	19.		335.4	29.
C6420		119.0	2148.0		595.0	10740.0	5	1	0.		48.7	5.
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		2.3	45.0	45	1	38.		1.9	7.
C6658		.1	1.0		.3	5.0	5	1	5.		.3	
C6684		.0	1.0		.6	60.0	60	1	60.		.6	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	4	1.	97.5		
D0100		20.0	163.0		40.0	326.0	2	2	2.		40.0	
D0390		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0693		.0	1.0		.0	1.0	1	2	1.		.0	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	

CONSTRAINED T/E FOR UNIT M8914

H+MS, (MAG VH) MAW, FMF

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3880.49 CU FT
CONSTRAINED TO 62.5 PCT OR 2425.00 CU FT

SQUARE OF PUBLISHED T/E IS 3046.00 SQ FT
CONSTRAINED TO 62.5 PCT OR 1904.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	138.0		1710.0	3	4	2.	107.9		1.
D0850	93.0		2710.0	186.0		5420.0	2	4	2.	141.8		
D0885	61.0		500.0	122.0		1000.0	2	4	2.	100.8		
D1030	176.0		13660.0	704.0		54640.0	4	4	2.	403.4		2.
D1160	61.0		2400.0	488.0		19200.0	8	4	5.	231.4		3.
D1186	124.0		5460.0	496.0		21840.0	4	4	2.	305.9		2.
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				3046.0	3880.5	255202.0	994		829.	1904.0	2425.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 64.94
OR INDEX(CUBE) = 84.24
OR INDEX(TOTAL T/E) = 82.29

CONSTRAINED T/E FOR UNIT M8821

MARINE AIR TRAFFIC CONTROL UNIT, MAG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 873.09 CU FT
CONSTRAINED TO 85.0 PCT OR 742.00 CU FT

SQUARE OF PUBLISHED T/E IS 772.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 656.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	OFFIC-IENCY
A0912		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		1.3	15.0	5	1	5.		1.3	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2070		1.9	60.0		1.9	60.0	1	1	1.		1.9	
C2080		.2	5.0		.4	10.0	2	1	2.		.4	
C2100		.2	3.0		.2	3.0	1	1	1.		.2	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		72.3	1168.0	73	1	62.		61.1	11.
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4110		1.1	10.0		2.2	20.0	2	1	2.		2.2	
C4140		.5	10.0		.5	10.0	1	1	1.		.5	
C4205		.1	50.0		.1	50.0	1	1	1.		.1	
C4208		.1	50.0		.6	600.0	12	1	12.		.6	
C4340		11.0	64.0		11.0	64.0	1	1	1.		11.0	
C4436		.0	1.0		.2	24.0	24	1	24.		.2	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4760		53.3	633.0		106.6	1266.0	2	1	2.		106.6	
C4766		.0	1.0		.0	4.0	4	1	4.		.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		15.0	150.0	1	1	1.		15.0	
C4870		6.4	85.0		12.7	170.0	2	1	2.		12.7	
C4880		3.6	8.0		10.7	24.0	3	1	3.		10.7	
C4900		124.0	600.0		124.0	600.0	1	1	1.		62.8	
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		8.0	42.0	3	1	3.		8.0	
C5200		3.8	4.0		30.2	32.0	8	1	8.		30.2	
C5320		8.2	162.0		8.2	162.0	1	1	1.		8.2	
C5400		7.0	150.0		20.9	450.0	3	1	3.		20.9	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C6220		.5	5.0		.5	5.0	1	1	1.		.5	
C6345		.1	1.0		.6	12.0	12	1	12.		.6	
C6370		6.3	107.0		6.3	107.0	1	1	1.		6.3	
C6388		5.9	140.0		5.9	140.0	1	1	1.		5.9	
C6390		7.2	257.0		7.2	257.0	1	1	1.		7.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		[illegible]	2148.0	1	1	1.		60.3	

NOTE:

Unit = M8821
Constraint = 90%

CONSTRAINED T/E FOR UNIT M8821

MARINE AIR TRAFFIC CONTROL UNIT, MAG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 873.09 CU FT
CONSTRAINED TO 85.0 PCT OR 742.00 CU FT

SQUARE OF PUBLISHED T/E IS 772.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 656.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6590		31.0	600.0		31.0	600.0	1	1	1.		31.0	
C6655		.1	1.0		.1	1.0	1	1	1.		.1	
C6684		.0	1.0		.1	10.0	10	1	10.		.1	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0840	46.0		570.0	46.0		570.0	1	2	1.	44.3		
D0860	96.0		2750.0	96.0		2750.0	1	2	1.	83.0		
D0880	93.0		2710.0	93.0		2710.0	1	2	1.	80.9		
D1030	176.0		13660.0	352.0		27320.0	2	2	2.	267.3		
D1160	61.0		2400.0	61.0		2400.0	1	2	1.	56.5		
D1186	124.0		5460.0	124.0		5460.0	1	8	1.	124.0		
E0090		.4	7.0		1.2	21.0	3	1	3.		1.2	
GRAND TOTALS				772.0	873.1	53381.0	244		231.	656.0	742.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 91.43
OR INDEX(CUBE) = 95.00
OR INDEX(TOTAL T/E) = 94.73

CONSTRAINED T/E FOR UNIT M8821

MARINE AIR TRAFFIC CONTROL UNIT, MAG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 873.00 CU FT
CONSTRAINED TO 77.5 PCT OR 677.00 CU FT

SQUARE OF PUBLISHED T/E IS 772.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 598.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0912		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		1.3	15.0	5	1	5.		1.3	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2070		1.9	60.0		1.9	60.0	1	1	1.		1.9	
C2080		.2	5.0		.4	10.0	2	1	2.		.4	
C2100		.2	3.0		.2	3.0	1	1	1.		.2	
C2150		.1	1.0		.7	10.0	10	1	10.		.7	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		72.3	1168.0	73	1	56.		55.5	17.
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4110		1.1	10.0		2.2	20.0	2	1	2.		2.2	
C4140		.5	10.0		.5	10.0	1	1	1.		.5	
C4205		.1	50.0		.1	50.0	1	1	1.		.1	
C4208		.1	50.0		.6	600.0	12	1	12.		.6	
C4340		11.0	64.0		11.0	64.0	1	1	1.		11.0	
C4436		.0	1.0		.2	24.0	24	1	24.		.2	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4750		53.3	633.0		106.6	1266.0	2	1	2.		106.6	
C4766		.0	1.0		.0	4.0	4	1	4.		.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		15.0	150.0	1	1	1.		15.0	
C4870		6.4	85.0		12.7	170.0	2	1	2.		12.7	
C4880		3.6	8.0		10.7	24.0	3	1	3.		10.7	
C4900		124.0	600.0		124.0	600.0	1	1	0.		32.5	1.
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		8.0	42.0	3	1	3.		8.0	
C5200		3.8	4.0		30.2	32.0	8	1	8.		30.2	
C5320		8.2	162.0		8.2	162.0	1	1	1.		8.2	
C5400		7.0	150.0		20.9	450.0	3	1	3.		20.9	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C6220		.5	5.0		.5	5.0	1	1	1.		.5	
C6345		.1	1.0		.6	12.0	12	1	12.		.6	
C6370		6.3	107.0		6.3	107.0	1	1	1.		6.3	
C6388		5.9	140.0		5.9	140.0	1	1	1.		5.9	
C6390		7.2	257.0		7.2	257.0	1	1	1.		7.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		119.0	2148.0	1	1	0.		31.2	1.

NOTE:

Unit = M8821
Constraint = 85%

CONSTRAINED T/E FOR UNIT M8821

MARINE AIR TRAFFIC CONTROL UNIT, MAG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 873.09 CU FT
CONSTRAINED TO 77.5 PCT OR 677.00 CU FT

SQUARE OF PUBLISHED T/E IS 772.00 SQ FT
CONSTRAINED TO 77.5 PCT OR 598.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	OFFIC-IENCY
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6590		31.0	600.0		31.0	600.0	1	1	1.		31.0	
C6655		.1	1.0		.1	1.0	1	1	1.		.1	
C6684		.0	1.0		.1	10.0	10	1	10.		.1	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0840	46.0		570.0	46.0		570.0	1	2	1.	43.4		
D0860	95.0		2750.0	96.0		2750.0	1	2	1.	76.5		
D0880	93.0		2710.0	93.0		2710.0	1	2	1.	74.8		
D1030	176.0		13660.0	352.0		27320.0	2	2	1.	224.9		1.
D1160	61.0		2400.0	61.0		2400.0	1	2	1.	54.3		
D1186	124.0		5460.0	124.0		5460.0	1	8	1.	124.0		
E0090		.4	7.0		1.2	21.0	3	1	3.		1.2	
GRAND TOTALS				772.0	873.1	53381.0	244		224.	598.0	677.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 87.14
OR INDEX(CUBE) = 92.53
OR INDEX(TOTAL T/E) = 92.12

CONSTRAINED T/E FOR UNIT M8821

MARINE AIR TRAFFIC CONTROL UNIT, MAG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 873.09 CU FT
CONSTRAINED TO 62.5 PCT OR 546.00 CU FT

SQUARE OF PUBLISHED T/E IS 772.00 SQ FT
CONSTRAINED TO 62.6 PCT OR 483.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0912		1.0	42.0		1.0	42.0	1	4	1.		1.0	
A2510		53.0	145.0		53.0	145.0	1	4	1.		53.0	
B0510		.1	2.0		.1	2.0	1	2	1.		.1	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		1.3	15.0	5	1	5.		1.3	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2070		1.9	60.0		1.9	60.0	1	1	1.		1.9	
C2080		.2	5.0		.4	10.0	2	1	2.		.4	
C2100		.2	3.0		.2	3.0	1	1	1.		.2	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		72.3	1168.0	73	1	49.		48.8	24.
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4110		1.1	10.0		2.2	20.0	2	1	2.		2.2	
C4140		.5	10.0		.5	10.0	1	1	1.		.5	
C4205		.1	50.0		.1	50.0	1	1	1.		.1	
C4208		.1	50.0		.6	600.0	12	1	12.		.6	
C4340		11.0	64.0		11.0	64.0	1	1	1.		11.0	
C4436		.0	1.0		.2	24.0	24	1	24.		.2	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4760		53.3	633.0		106.6	1266.0	2	1	0.		14.0	2.
C4766		.0	1.0		.0	4.0	4	1	4.		.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		15.0	150.0	1	1	1.		15.0	
C4870		6.4	85.0		12.7	170.0	2	1	2.		12.7	
C4880		3.6	8.0		10.7	24.0	3	1	3.		10.7	
C4900		124.0	600.0		124.0	600.0	1	1	0.		16.3	1.
C4960		3.9	95.0		3.9	95.0	1	1	1.		3.9	
C5100		2.7	127.0		2.7	127.0	1	1	1.		2.7	
C5110		2.7	14.0		8.0	42.0	3	1	3.		8.0	
C5200		3.8	4.0		30.2	32.0	8	1	8.		30.2	
C5320		8.2	162.0		8.2	162.0	1	1	1.		8.2	
C5400		7.0	150.0		20.9	450.0	3	1	3.		20.9	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C6220		.5	5.0		.5	5.0	1	1	1.		.5	
C6345		.1	1.0		.6	12.0	12	1	12.		.6	
C6370		6.3	107.0		6.3	107.0	1	1	1.		6.3	
C6388		5.9	140.0		5.9	140.0	1	1	1.		5.9	
C6390		7.2	257.0		7.2	257.0	1	1	1.		7.2	
C6410		18.0	330.0		144.0	2640.0	8	1	8.		144.0	
C6420		119.0	2148.0		119.0	2148.0	1	1	0.		15.7	1.

NOTE:

Unit = M8821
Constraint = 75%

CONSTRAINED T/E FOR UNIT 48821

MARINE AIR TRAFFIC CONTROL UNIT, MAG

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 873.09 CU FT
CONSTRAINED TO 62.5 PCT OR 546.00 CU FT

SQUARE OF PUBLISHED T/E IS 772.00 SQ FT
CONSTRAINED TO 62.6 PCT OR 483.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC- IENCY
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6590		31.0	600.0		31.0	600.0	1	1	1.		31.0	
C6655		.1	1.0		.1	1.0	1	1	1.		.1	
C6684		.0	1.0		.1	10.0	10	1	10.		.1	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0840	46.0		570.0	46.0		570.0	1	2	1.	36.5		
D0860	96.0		2750.0	96.0		2750.0	1	2	1.	58.4		
D0880	93.0		2710.0	93.0		2710.0	1	2	1.	57.4		
D1030	176.0		13660.0	352.0		27320.0	2	2	1.	162.4		1.
D1160	61.0		2400.0	61.0		2400.0	1	2	1.	44.3		
D1186	124.0		5460.0	124.0		5460.0	1	8	1.	124.0		
E0090		.4	7.0		1.2	21.0	3	1	3.		1.2	
GRAND TOTALS				772.0	873.1	53381.0	244		214.	483.0	546.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 76.68
OR INDEX(CUBE) = 88.94
OR INDEX(TOTAL T/E) = 88.02

CONSTRAINED T/E FOR UNIT M8970

MARINE HELICOPTER ATTACK SQUADRON(HMA)

CURTAIL T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 1478.60 CU FT
CONSTRAINED TO 95.0 PCT OR 1405.00 CU FT

SQUARE OF PUBLISHED T/E IS 2245.00 SQ FT
CONSTRAINED TO 95.0 PCT OR 2133.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E***** CUBE	DEFIC-IENCY
A0870		7.0	182.0		7.0	182.0	1	2	1.		7.0	
A2480		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B1540		1.0	116.0		1.0	116.0	1	2	1.		1.0	
B1650		13.0	355.0		13.0	355.0	1	2	1.		13.0	
B1620		173.0	960.0		173.0	960.0	1	2	1.		173.0	
B2030		2.5	84.0		74.4	2520.0	30	2	23.		56.2	7.
B2210		5.1	145.0		5.1	145.0	1	2	1.		5.1	
B2240		.8	82.0		.8	82.0	1	2	1.		.8	
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	2.0	2	1	2.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2235		.3	7.0		30.2	728.0	104	1	87.		25.2	17.
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		126.7	2048.0	128	1	98.		97.5	30.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		4.3	40.0	4	1	4.		4.3	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.9	93.0	93	1	93.		.9	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		10.6	56.0	4	1	4.		10.6	
C5200		3.8	4.0		11.3	12.0	3	1	3.		11.3	

NOTE:

Unit = M8970
Constraint = 90%

CONSTRAINED T/E FOR UNIT M8970

MARINE HELICOPTER ATTACK SQUADRON(HMA)

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 1478.60 CU FT
CONSTRAINED TO 95.0 PCT OR 1405.00 CU FT

SQUARE OF PUBLISHED T/E IS 2245.00 SQ FT
CONSTRAINED TO 95.0 PCT OR 2133.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C5320		8.2	162.0		40.8	810.0	5	1	5.		40.8	
C5400		7.0	150.0		20.9	450.0	3	1	3.		20.9	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5850		.1	1.0		.5	8.0	8	1	8.		.5	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		5.5	200.0	2	1	2.		5.5	
C6220		.5	5.0		1.0	10.0	2	1	2.		1.0	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6398		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6410		18.0	330.0		288.0	5280.0	16	1	15.		266.8	1.
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6684		.0	1.0		.5	53.0	53	1	53.		.5	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	2	1.	125.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	46.0		570.0	1	2	1.	46.0		
D0880	93.0		2710.0	279.0		8130.0	3	2	3.	275.1		
D0888	257.0		19260.0	771.0		57780.0	3	4	3.	746.1		
D1030	176.0		13660.0	704.0		54640.0	4	2	4.	632.7		
D1160	61.0		2400.0	244.0		9600.0	4	2	4.	232.1		
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
F2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				2245.0	1478.6	160255.0	593		537.	2133.0	1405.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 95.82
OR INDEX(CUBE) = 99.98
OR INDEX(TOTAL T/E) = 90.33

CONSTRAINED T/E FOR UNIT M8970

MARINE HELICOPTER ATTACK SQUADRON(HMA)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 1478.50 CU FT
CONSTRAINED TO 92.5 PCT OR 1368.00 CU FT

SQUARE OF PUBLISHED T/E IS 2245.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 2077.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0870		7.0	182.0		7.0	182.0	1	2	1.		7.0	
A2480		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B1550		1.0	116.0		1.0	116.0	1	2	1.		1.0	
B1650		13.0	355.0		13.0	355.0	1	2	1.		13.0	
B1690		173.0	960.0		173.0	960.0	1	2	1.		173.0	
B2030		2.5	84.0		74.4	2520.0	30	2	21.		51.5	9.
B2210		5.1	145.0		5.1	145.0	1	2	1.		5.1	
B2240		.8	82.0		.8	82.0	1	2	1.		.8	
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	2.0	2	1	2.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2235		.3	7.0		30.2	728.0	104	1	82.		23.7	22.
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		126.7	2048.0	128	1	91.		89.9	37.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		4.3	40.0	4	1	4.		4.3	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.9	93.0	93	1	93.		.9	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		10.6	56.0	4	1	4.		10.6	
C5200		3.8	4.0		11.3	12.0	3	1	3.		11.3	

NOTE:

Unit = M8970
Constraint = 85%

CONSTRAINED T/E FOR UNIT M8970

MARINE HELICOPTER ATTACK SQUADRON(HMA)

· CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 1478.60 CU FT
CONSTRAINED TO 92.5 PCT OR 1368.00 CU FT

SQUARE OF PUBLISHED T/E IS 2245.00 SQ FT
CONSTRAINED TO 92.5 PCT OR 2077.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFFIC-IENCY
C5320		8.2	162.0		40.8	810.0	5	1	5.		40.8	
C5400		7.0	150.0		20.9	450.0	3	1	3.		20.9	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5850		.1	1.0		.5	8.0	8	1	8.		.5	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		5.5	200.0	2	1	2.		5.5	
C6220		.5	5.0		1.0	10.0	2	1	2.		1.0	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6410		18.0	330.0		288.0	5280.0	16	1	14.		243.5	2.
C6430		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6684		.0	1.0		.5	53.0	53	1	53.		.5	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	2	1.	125.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	46.0		570.0	1	2	1.	46.0		
D0880	93.0		2710.0	279.0		8130.0	3	2	3.	273.1		
D0888	257.0		19260.0	771.0		57780.0	3	4	3.	733.6		
D1030	176.0		13660.0	704.0		54640.0	4	2	3.	597.1		1.
D1160	61.0		2400.0	244.0		9600.0	4	2	4.	226.2		
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				2245.0	1478.6	160255.0	593		521.	2077.0	1368.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 93.73
OR INDEX(CUBE) = 87.16
OR INDEX(TOTAL T/E) = 87.56

CONSTRAINED T/E FOR UNIT M8970

MARINE HELICOPTER ATTACK SQUADRON(HMA)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 1478.60 CU FT
CONSTRAINED TO 87.5 PCT OR 1294.00 CU FT

SQUARE OF PUBLISHED T/E IS 2245.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 1964.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0870		7.0	182.0		7.0	182.0	1	2	1.		7.0	
A2480		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B0630	75.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B1540		1.0	116.0		1.0	116.0	1	2	1.		1.0	
B1650		13.0	355.0		13.0	355.0	1	2	1.		13.0	
B1690		173.0	960.0		173.0	960.0	1	2	0.		84.5	1.
B2030		2.5	84.0		74.4	2520.0	30	2	24.		60.3	6.
B2210		5.1	145.0		5.1	145.0	1	2	1.		5.1	
B2240		.8	82.0		.8	82.0	1	2	1.		.8	
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	2.0	2	1	2.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2235		.3	7.0		30.2	728.0	104	1	90.		26.1	14.
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		126.7	2048.0	128	1	105.		103.9	23.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		4.3	40.0	4	1	4.		4.3	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4250		4.2	53.0		4.2	53.0	1	1	1.		4.2	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.9	93.0	93	1	93.		.9	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		10.6	56.0	4	1	4.		10.6	
C5200		3.8	4.0		11.3	12.0	3	1	3.		11.3	

NOTE:

Unit = M8970
Constraint = 75%

CONSTRAINED T/E FOR UNIT M8970

MARINE HELICOPTER ATTACK SQUADRON(HMA)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 1478.60 CU FT
CONSTRAINED TO 87.5 PCT OR 1294.00 CU FT

SQUARE OF PUBLISHED T/E IS 2245.00 SQ FT
CONSTRAINED TO 87.5 PCT OR 1964.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E**** SQUARE	CUBE	DEFIC-IENCY
C5320		8.2	162.0		40.8	810.0	5	1	5.		40.8	
C5400		7.0	150.0		20.9	450.0	3	1	3.		20.9	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5850		.1	1.0		.5	8.0	8	1	8.		.5	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		5.5	200.0	2	1	2.		5.5	
C6220		.5	5.0		1.0	10.0	2	1	2.		1.0	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6370		6.3	107.0		50.4	856.0	8	1	8.		50.4	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6410		18.0	330.0		288.0	5280.0	16	1	13.		232.8	3.
C6430		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6660		3.2	30.0		3.2	30.0	1	1	1.		3.2	
C6664		.0	1.0		.5	53.0	53	1	53.		.5	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080	125.0		2650.0	125.0		2650.0	1	2	1.	125.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	46.0		570.0	1	2	1.	46.0		
D0880	93.0		2710.0	279.0		8130.0	3	2	3.	252.9		
D0888	257.0		19260.0	771.0		57780.0	3	4	3.	679.9		
D1030	176.0		13660.0	704.0		54640.0	4	2	3.	569.6		1.
D1160	61.0		2400.0	244.0		9600.0	4	2	4.	214.5		
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				2245.0	1478.6	160255.0	593		545.	1964.0	1294.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 88.82
OR INDEX(CUBE) = 91.61
OR INDEX(TOTAL T/E) = 91.44

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 95.0 PCT OR 2706.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 2127.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E SQUARE	T/E**** CUBE	DEFIC-IENCY
A0870		7.0	182.0		7.0	182.0	1	2	1.		7.0	
A2460		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B1540		1.0	116.0		1.0	116.0	1	2	1.		1.0	
B2030		2.5	84.0		74.4	2520.0	30	2	25.		62.9	5.
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		3.1	75.0	15	1	15.		3.1	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	2.0	2	1	2.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2235		.3	7.0		27.8	672.0	96	1	96.		27.8	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		140.6	2272.0	142	1	122.		121.1	20.
C4000		6.3	80.0		18.9	240.0	3	1	3.		18.9	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		5.4	50.0	5	1	5.		5.4	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4205		.1	1.0		.1	1.0	1	1	1.		.1	
C4208		.1	1.0		1.9	38.0	38	1	38.		1.9	
C4230		.7	45.0		.7	45.0	1	1	1.		.7	
C4250		4.2	53.0		16.8	212.0	4	1	4.		16.8	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		1.2	118.0	118	1	118.		1.2	
C4555		0.0	0.0		0.0	0.0	4	1	4.		0.0	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		105.0	1050.0	7	1	7.		105.0	
C4[illegible]		6.4	[illegible]		63.7	850.0	10	1	10.		63.7	

NOTE:

Unit = M8937
Constraint = 90%

CONSTRAINED T/E FOR UNIT M9937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 95.0 PCT OR 2706.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 90.9 PCT OR 2127.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C4330		3.6	8.0		42.7	96.0	12	1	12.		42.7	
C4930		14.0	150.0		98.0	1050.0	7	1	7.		98.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		18.6	98.0	7	1	7.		18.6	
C5200		3.8	4.0		94.5	100.0	25	1	23.		87.6	2.
C5320		8.2	162.0		49.0	972.0	6	1	6.		49.0	
C5400		7.0	150.0		13.9	300.0	2	1	2.		13.9	
C5820		25.0	353.0		125.0	1765.0	5	1	5.		125.0	
C5850		.1	1.0		1.4	24.0	24	1	24.		1.4	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		5.5	200.0	2	1	2.		5.5	
C6140		.2	7.0		.2	7.0	1	1	1.		.2	
C6220		.5	5.0		1.0	10.0	2	1	2.		1.0	
C6345		.1	1.0		1.5	30.0	30	1	30.		1.5	
C6370		6.3	107.0		69.3	1177.0	11	1	11.		69.3	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6410		18.0	330.0		458.0	8580.0	26	1	20.		364.0	6.
C6420		119.0	2148.0		357.0	6444.0	3	1	3.		357.0	
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		.6	13.0	13	1	13.		.6	
C6658		.1	1.0		.1	3.0	3	1	3.		.1	
C6692		0.0	0.0		0.0	0.0	1	1	1.		0.0	
C6684		.0	1.0		.7	72.0	72	1	72.		.7	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080		499.0	2650.0		499.0	2650.0	1	2	1.		499.0	
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.9	710.0	1	2	1.		35.8	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	92.0		1140.0	2	2	2.	92.0		
D0880	93.0		2710.0	186.0		5420.0	2	2	2.	183.5		
D0885	61.0		500.0	122.0		1000.0	2	4	2.	122.0		
D0888	257.0		19260.0	771.0		57780.0	3	4	3.	678.8		
D1030	176.0		13660.0	352.0		27320.0	2	2	2.	325.5		
D1160	61.0		2400.0	244.0		9600.0	4	2	4.	214.2		

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 95.0 PCT OR 2706.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 90.9 PCT OR 2127.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D1186	124.0		5460.0	496.0		21840.0	4	4	4.	435.0		
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
	GRAND TOTALS			2339.0	2847.9	157031.0	842		809.	2127.0	2706.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 91.83
OR INDEX(CUBE) = 95.79
OR INDEX(TOTAL T/E) = 95.54

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 92.5 PCT OR 2634.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 88.5 PCT OR 2071.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
A0870		7.0	182.0		7.0	182.0	1	2	1.		7.0	
A2480		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B0630	76.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B1540		1.0	116.0		1.0	116.0	1	2	1.		1.0	
B2030		2.5	84.0		74.4	2520.0	30	2	24.		58.3	6.
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		3.1	75.0	15	1	15.		3.1	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	2.0	2	1	2.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2235		.3	7.0		27.8	672.0	96	1	83.		24.2	13.
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		140.6	2272.0	142	1	113.		111.7	29.
C4000		6.3	80.0		18.9	240.0	3	1	3.		18.9	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		5.4	50.0	5	1	5.		5.4	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4205		.1	1.0		.1	1.0	1	1	1.		.1	
C4208		.1	1.0		1.9	38.0	38	1	38.		1.9	
C4230		.7	45.0		.7	45.0	1	1	1.		.7	
C4250		4.2	53.0		16.8	212.0	4	1	4.		16.8	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		1.2	118.0	118	1	118.		1.2	
C4555		0.0	0.0		0.0	0.0	4	1	4.		0.0	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4700		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		105.0	1050.0	7	1	7.		105.0	
C4870		6.4	85.0		63.7	850.0	10	1	10.		63.7	

NOTE:

Unit = M8937
Constraint = 85%

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 92.5 PCT OR 2634.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 88.5 PCT OR 2071.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4880		3.6	8.0		42.7	96.0	12	1	12.		42.7	
C4980		14.0	150.0		98.0	1050.0	7	1	7.		98.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		18.6	98.0	7	1	7.		18.6	
C5200		3.8	4.0		94.5	100.0	25	1	21.		79.8	4.
C5320		8.2	162.0		49.0	972.0	6	1	6.		49.0	
C5400		7.0	150.0		13.9	300.0	2	1	2.		13.9	
C5820		25.0	353.0		125.0	1765.0	5	1	5.		125.0	
C5850		.1	1.0		1.4	24.0	24	1	24.		1.4	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		5.5	200.0	2	1	2.		5.5	
C6140		.2	7.0		.2	7.0	1	1	1.		.2	
C6220		.5	5.0		1.0	10.0	2	1	2.		1.0	
C6345		.1	1.0		1.5	30.0	30	1	30.		1.5	
C6370		6.3	107.0		69.3	1177.0	11	1	11.		69.3	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6410		18.0	330.0		468.0	8580.0	26	1	18.		317.3	8.
C6420		119.0	2148.0		357.0	6444.0	3	1	3.		357.0	
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		.6	13.0	13	1	13.		.6	
C6658		.1	1.0		.1	3.0	3	1	3.		.1	
C6682		0.0	0.0		0.0	0.0	1	1	1.		0.0	
C6684		.0	1.0		.7	72.0	72	1	72.		.7	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080		499.0	2650.0		499.0	2650.0	1	2	1.		499.0	
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	92.0		1140.0	2	2	2.	92.0		
D0880	93.0		2710.0	186.0		5420.0	2	2	2.	182.9		
D0885	61.0		500.0	122.0		1000.0	2	4	2.	122.0		
D0888	257.0		19260.0	771.0		57780.0	3	4	3.	654.5		
D1030	176.0		13660.0	352.0		27320.0	2	2	2.	318.5		
D1160	61.0		2400.0	244.0		9600.0	4	2	3.	206.3		1.

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII. CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 92.5 PCT OR 2634.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 88.5 PCT OR 2071.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D1186	124.0		5460.0	496.0		21840.0	4	4	3.	418.9		1.
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
GRAND TOTALS				2339.0	2847.9	167031.0	842		780.	2071.0	2634.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 89.68
OR INDEX(CUBE) = 92.30
OR INDEX(TOTAL T/E) = 92.13

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 87.5 PCT OR 2492.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 83.8 PCT OR 1959.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E***** SQUARE	CUBE	DEFIC-IENCY
A0870		7.0	182.0		7.0	182.0	1	2	1.		7.0	
A2480		1.0	28.0		1.0	28.0	1	2	1.		1.0	
B0632	76.0		2680.0	76.0		2680.0	1	2	1.	76.0		
B1540		1.0	116.0		1.0	116.0	1	2	1.		1.0	
B2030		2.5	84.0		74.4	2520.0	30	2	26.		64.7	4.
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2030		.5	6.0		2.4	30.0	5	1	5.		2.4	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2080		.2	5.0		3.1	75.0	15	1	15.		3.1	
C2100		.2	3.0		.3	6.0	2	1	2.		.3	
C2120		37.7	620.0		75.4	1240.0	2	1	2.		75.4	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	2.0	2	1	2.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2235		.3	7.0		27.8	672.0	96	1	88.		25.4	8.
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		140.6	2272.0	142	1	125.		123.3	17.
C4000		6.3	80.0		18.9	240.0	3	1	3.		18.9	
C4020		.1	5.0		.2	10.0	2	1	2.		.2	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		5.4	50.0	5	1	5.		5.4	
C4140		.5	10.0		1.0	20.0	2	1	2.		1.0	
C4205		.1	1.0		.1	1.0	1	1	1.		.1	
C4208		.1	1.0		1.9	38.0	38	1	38.		1.9	
C4230		.7	45.0		.7	45.0	1	1	1.		.7	
C4250		4.2	53.0		16.8	212.0	4	1	4.		16.8	
C4340		11.0	64.0		22.0	128.0	2	1	2.		22.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		1.2	118.0	118	1	118.		1.2	
C4555		0.0	0.0		0.0	0.0	4	1	4.		0.0	
C4650		3.0	85.0		3.0	85.0	1	1	1.		3.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.2	2.0	1	1	1.		.2	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4790		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4820		15.0	150.0		105.0	1050.0	7	1	7.		105.0	
C4870		6.4	85.0		63.7	850.0	10	1	10.		63.7	

NOTE:

Unit = M8937
Constraint = 75%

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 87.5 PCT OR 2492.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 83.8 PCT OR 1959.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C4880		3.6	8.0		42.7	96.0	12	1	12.		42.7	
C4980		14.0	150.0		98.0	1050.0	7	1	7.		98.0	
C5080		15.0	250.0		30.0	500.0	2	1	2.		30.0	
C5110		2.7	14.0		18.6	98.0	7	1	7.		18.6	
C5200		3.8	4.0		94.5	100.0	25	1	22.		84.3	3.
C5320		8.2	162.0		49.0	972.0	6	1	6.		49.0	
C5400		7.0	150.0		13.9	300.0	2	1	2.		13.9	
C5820		25.0	353.0		125.0	1765.0	5	1	5.		125.0	
C5850		.1	1.0		1.4	24.0	24	1	24.		1.4	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		5.5	200.0	2	1	2.		5.5	
C6140		.2	7.0		.2	7.0	1	1	1.		.2	
C6220		.5	5.0		1.0	10.0	2	1	2.		1.0	
C6345		.1	1.0		1.5	30.0	30	1	30.		1.5	
C6370		6.3	107.0		69.3	1177.0	11	1	11.		69.3	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6410		18.0	330.0		468.0	8580.0	26	1	21.		375.5	5.
C6420		119.0	2148.0		357.0	6444.0	3	1	3.		357.0	
C6490		1.5	62.0		4.5	186.0	3	1	3.		4.5	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		.6	13.0	13	1	13.		.6	
C6658		.1	1.0		.1	3.0	3	1	3.		.1	
C6682		0.0	0.0		0.0	0.0	1	1	1.		0.0	
C6684		.0	1.0		.7	72.0	72	1	72.		.7	
C6695		.0	1.0		.0	1.0	1	1	1.		.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0080		499.0	2650.0		499.0	2650.0	1	2	1.		275.2	
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0420		.7	11.0		.7	11.0	1	2	1.		.7	
D0694		.0	1.0		.0	1.0	1	2	1.		.0	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0750		.3	8.0		.3	8.0	1	2	1.		.3	
D0770		90.7	1890.0		90.7	1890.0	1	2	1.		90.7	
D0840	46.0		570.0	92.0		1140.0	2	2	2.	92.0		
D0880	93.0		2710.0	186.0		5420.0	2	2	2.	171.2		
D0885	61.0		500.0	122.0		1000.0	2	4	2.	122.0		
D0888	257.0		19260.0	771.0		57780.0	3	4	2.	611.5		1.
D1030	176.0		13660.0	352.0		27320.0	2	2	2.	293.7		
D1160	61.0		2400.0	244.0		9600.0	4	2	3.	195.6		1.

CONSTRAINED T/E FOR UNIT M8937

MARINE MEDIUM HELICOPTER SQUADRON(HMM)

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 2847.91 CU FT
CONSTRAINED TO 87.5 PCT OR 2492.00 CU FT

SQUARE OF PUBLISHED T/E IS 2339.00 SQ FT
CONSTRAINED TO 83.8 PCT OR 1959.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
01186	124.0		5460.0	496.0		21840.0	4	4	3.	397.0		1.
E2030		1.1	39.0		1.1	39.0	1	2	1.		1.1	
	GRAND TOTALS			2339.0	2847.9	167031.0	842		801.	1959.0	2492.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 85.79
OR INDEX(CUBE) = 95.12
OR INDEX(TOTAL T/E) = 94.53

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 90.0 PCT OR 2953.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 3880.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
A0090		3.0	47.0		9.0	141.0	3	4	3.		9.0	
A0320		1.0	20.0		23.0	460.0	23	4	23.		23.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	4	15.		15.0	
A1900	70.0		4190.0	70.0		4190.0	1	4	1.	70.0		
A1940		350.0	2575.0		350.0	2575.0	1	4	1.		350.0	
A2020		8.0	139.0		184.0	3197.0	23	4	23.		184.0	
A2050		1.0	20.0		90.0	1800.0	90	4	90.		90.0	
A2480		1.0	28.0		1.0	28.0	1	4	1.		1.0	
B2240		.8	82.0		1.6	164.0	2	2	2.		1.6	
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2100		.2	3.0		.2	3.0	1	1	1.		.2	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		277.2	4480.0	280	1	239.		236.5	41.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.1	5.0	1	1	1.		.1	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		6.5	60.0	6	1	6.		6.5	
C4140		.5	10.0		.5	10.0	1	1	1.		.5	
C4250		4.2	53.0		8.4	106.0	2	1	2.		8.4	
C4290		11.0	180.0		165.0	2700.0	15	1	15.		165.0	
C4340		11.0	64.0		11.0	64.0	1	1	1.		11.0	
C4390		7.7	60.0		7.7	50.0	1	1	1.		7.7	
C4436		.0	1.0		.9	90.0	90	1	90.		.9	
C4650		3.0	85.0		6.0	170.0	2	1	2.		6.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4700		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C4880		3.6	8.0		49.3	112.0	14	1	14.		49.8	
C4930		.4	12.0		.4	12.0	1	1	1.		.4	

NOTE:

Unit = M8625

Constraint = 90%

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTAIL T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 90.0 PCT OR 2953.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 3880.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
C4990		14.0	150.0		70.0	750.0	5	1	5.		70.0	
C5080		15.0	250.0		15.0	250.0	1	1	1.		15.0	
C5090		4.0	196.0		4.0	196.0	1	1	1.		4.0	
C5110		2.7	14.0		23.9	126.0	9	1	9.		23.9	
C5200		3.8	4.0		3.8	4.0	1	1	1.		3.8	
C5320		8.2	162.0		65.3	1296.0	8	1	8.		65.3	
C5400		7.0	150.0		13.9	300.0	2	1	2.		13.9	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		2.8	100.0	1	1	1.		2.8	
C6130		6.3	246.0		6.3	246.0	1	1	1.		6.3	
C6140		.2	7.0		.2	7.0	1	1	1.		.2	
C6220		.5	5.0		1.5	15.0	3	1	3.		1.5	
C6250		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6290		.1	4.0		.1	4.0	1	1	1.		.1	
C6370		6.3	107.0		6.3	107.0	1	1	1.		6.3	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6390		7.2	257.0		57.4	2056.0	8	1	8.		57.4	
C6400		126.0	2136.0		126.0	2136.0	1	2	1.		126.0	
C6410		18.0	330.0		90.0	1650.0	5	1	5.		90.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		.4	8.0	8	1	8.		.4	
C6658		.1	1.0		.1	1.0	1	1	1.		.1	
C6684		.0	1.0		1.0	103.0	103	1	103.		1.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0090	38.0		1054.0	38.0		1054.0	1	2	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0170		4.0	517.0		4.0	517.0	1	1	1.		4.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0840	46.0		570.0	1196.0		14820.0	26	4	23.	1041.8		3.
D0860	96.0		2750.0	96.0		2750.0	1	4	1.	95.0		
D0880	93.0		2710.0	186.0		5420.0	2	4	2.	186.0		
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1050	176.0		13660.0	528.0		40980.0	3	4	3.	521.8		
D1190	18.0		900.0	540.0		27000.0	30	4	27.	492.0		3.

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 90.0 PCT OR 2953.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 90.0 PCT OR 3880.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFICIENCY
D1160	61.0		2400.0	1586.0		62400.0	26	4	22.	1353.4		4.
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E0090		.4	7.0		32.0	574.0	82	1	74.		28.7	8.
E0210		.0	1.0		1.0	98.0	99	1	98.		1.0	
E0590		7.0	71.0		1050.0	10650.0	150	1	109.		766.4	41.
E3195		0.0	0.0		0.0	0.0	15	1	15.		0.0	
GRAND TOTALS				4311.0	3280.6	206269.0	1265		1165.	3880.0	2953.0	

TODAYS DATE 03/03/76
OR INDEX(SQUARE) = 89.22
OR INDEX(CUBE) = 94.56
OR INDEX(TOTAL T/E) = 93.61

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 85.0 PCT OR 2788.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 3664.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	T/E***** SQUARE	CUBE	DEFIC-IENCY
A0090		3.0	47.0		9.0	141.0	3	4	3.		9.0	
A0320		1.0	20.0		23.0	460.0	23	4	23.		23.0	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	4	15.		15.0	
A1900	70.0		4190.0	70.0		4190.0	1	4	1.	70.0		
A1940		350.0	2575.0		350.0	2575.0	1	4	1.		350.0	
A2020		8.0	139.0		184.0	3197.0	23	4	21.		171.6	2.
A2050		1.0	20.0		90.0	1800.0	90	4	76.		75.9	14.
A2480		1.0	28.0		1.0	28.0	1	4	1.		1.0	
B2240		.8	82.0		1.6	164.0	2	2	2.		1.6	
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2100		.2	3.0		.2	3.0	1	1	1.		.2	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		277.2	4480.0	280	1	214.		211.7	66.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.1	5.0	1	1	1.		.1	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		6.5	60.0	6	1	6.		6.5	
C4140		.5	10.0		.5	10.0	1	1	1.		.5	
C4250		4.2	53.0		8.4	106.0	2	1	2.		8.4	
C4290		11.0	180.0		165.0	2700.0	15	1	15.		165.0	
C4340		11.0	64.0		11.0	64.0	1	1	1.		11.0	
C4330		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.9	90.0	90	1	90.		.9	
C4650		3.0	85.0		6.0	170.0	2	1	2.		6.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4630		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4770		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C4880		3.6	8.0		49.8	[illegible]	14	1	14.		49.8	
C4930		.4	12.0		.4	12.0	1	1	1.		.4	

NOTE:

Unit = M8625
Constraint = 85%

CONSTRAINED T/E FOR UNIT M3625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 85.0 PCT OR 2788.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 3664.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC- IENCY
C4980		14.0	150.0		70.0	750.0	5	1	5.		70.0	
C5080		15.0	250.0		15.0	250.0	1	1	1.		15.0	
C5090		4.0	196.0		4.0	196.0	1	1	1.		4.0	
C5110		2.7	14.0		23.9	126.0	9	1	9.		23.9	
C5200		3.8	4.0		3.8	4.0	1	1	1.		3.8	
C5320		8.2	162.0		65.3	1296.0	8	1	8.		65.3	
C5400		7.0	150.0		13.9	300.0	2	1	2.		13.9	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		2.8	100.0	1	1	1.		2.8	
C6130		6.3	246.0		6.3	246.0	1	1	1.		6.3	
C6140		.2	7.0		.2	7.0	1	1	1.		.2	
C6220		.5	5.0		1.5	15.0	3	1	3.		1.5	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6290		.1	4.0		.1	4.0	1	1	1.		.1	
C6370		6.3	107.0		6.3	107.0	1	1	1.		6.3	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6390		7.2	257.0		57.4	2056.0	8	1	8.		57.4	
C6400		126.0	2136.0		126.0	2136.0	1	2	1.		126.0	
C6410		18.0	330.0		90.0	1650.0	5	1	5.		90.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		.4	8.0	8	1	8.		.4	
C6658		.1	1.0		.1	1.0	1	1	1.		.1	
C6684		.0	1.0		1.0	103.0	103	1	103.		1.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0090	38.0		1054.0	38.0		1054.0	1	2	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0170		4.0	517.0		4.0	517.0	1	1	1.		4.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0840	46.0		570.0	1196.0		14820.0	26	4	21.	979.4		5.
D0860	96.0		2750.0	96.0		2750.0	1	4	1.	96.0		
D0880	93.0		2710.0	186.0		5420.0	2	4	2.	186.0		
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1030	176.0		13660.0	528.0		40980.0	3	4	3.	482.5		
D1100	18.0		900.0	540.0		27000.0	30	4	26.	464.3		4.

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 85.0 PCT OR 2788.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 85.0 PCT OR 3664.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
D1160	61.0		2400.0	1586.0		62400.0	26	4	21.	1276.8		5.
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E0090		.4	7.0		32.0	574.0	82	1	67.		26.3	15.
E0210		.0	1.0		1.0	98.0	98	1	98.		1.0	
E0590		7.0	71.0		1050.0	10650.0	150	1	94.		655.1	56.
E3195		0.0	0.0		0.0	0.0	15	1	15.		0.0	
	GRAND TOTALS			4311.0	3280.6	206269.0	1265		1098.	3664.0	2788.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 84.17
OR INDEX(CUBE) = 87.93
OR INDEX(TOTAL T/E) = 87.26

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 75.0 PCT OR 2460.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 3233.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E**** QTY	SQUARE	CUBE	DEFIC-IENCY
A0090		3.0	47.0		9.0	141.0	3	4	3.		9.0	
A0320		1.0	20.0		23.0	460.0	23	4	23.		22.6	
A1250		1.0	10.0		1.0	10.0	1	4	1.		1.0	
A1730		1.0	22.0		15.0	330.0	15	4	15.		15.0	
A1900	70.0		4190.0	70.0		4190.0	1	4	1.	70.0		
A1940		350.0	2575.0		350.0	2575.0	1	4	0.		90.2	1.
A2020		8.0	139.0		184.0	3197.0	23	4	19.		152.8	4.
A2050		1.0	20.0		90.0	1800.0	90	4	73.		73.1	17.
A2480		1.0	28.0		1.0	28.0	1	4	1.		1.0	
B2240		.8	82.0		1.6	164.0	2	2	2.		1.6	
C2000		.0	1.0		.0	1.0	1	1	1.		.0	
C2010		.3	4.0		1.5	20.0	5	1	5.		1.5	
C2040		.3	3.0		2.7	30.0	10	1	10.		2.7	
C2050		.8	7.0		3.8	35.0	5	1	5.		3.8	
C2060		.0	1.0		.0	1.0	1	1	1.		.0	
C2070		1.9	60.0		3.7	120.0	2	1	2.		3.7	
C2100		.2	3.0		.2	3.0	1	1	1.		.2	
C2160		.1	1.0		.7	10.0	10	1	10.		.7	
C2200		.0	1.0		.0	3.0	3	1	3.		.0	
C2230		.0	1.0		.0	1.0	1	1	1.		.0	
C2250		.2	2.0		.8	10.0	5	1	5.		.8	
C2310		.7	2.0		3.4	10.0	5	1	5.		3.4	
C3020		1.0	16.0		277.2	4480.0	280	1	207.		204.8	73.
C4000		6.3	80.0		12.6	160.0	2	1	2.		12.6	
C4010		2.0	50.0		2.0	50.0	1	1	1.		2.0	
C4020		.1	5.0		.1	5.0	1	1	1.		.1	
C4040		3.3	40.0		3.3	40.0	1	1	1.		3.3	
C4110		1.1	10.0		6.5	60.0	6	1	6.		6.5	
C4140		.5	10.0		.5	10.0	1	1	1.		.5	
C4250		4.2	53.0		8.4	106.0	2	1	2.		8.4	
C4290		11.0	180.0		165.0	2700.0	15	1	13.		144.7	2.
C4340		11.0	64.0		11.0	64.0	1	1	1.		11.0	
C4390		7.7	60.0		7.7	60.0	1	1	1.		7.7	
C4436		.0	1.0		.9	90.0	90	1	90.		.9	
C4650		3.0	85.0		6.0	170.0	2	1	2.		6.0	
C4660		12.0	204.0		12.0	204.0	1	1	1.		12.0	
C4670		1.4	6.0		1.4	6.0	1	1	1.		1.4	
C4680		.2	2.0		.4	4.0	2	1	2.		.4	
C4690		2.0	40.0		2.0	40.0	1	1	1.		2.0	
C4700		7.7	40.0		7.7	40.0	1	1	1.		7.7	
C4870		6.4	85.0		51.0	680.0	8	1	8.		51.0	
C4880		3.6	8.0		49.8	112.0	14	1	14.		49.8	
C4940		.4	12.0		.4	12.0	1	1	1.		.4	

NOTE:

Unit = M8625
Constraint = 75%

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 75.0 PCT OR 2460.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 3233.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED QTY	SQUARE	T/E**** CUBE	DEFIC-IENCY
C4980		14.0	150.0		70.0	750.0	5	1	5.		70.0	
C5030		15.0	250.0		15.0	250.0	1	1	1.		15.0	
C5090		4.0	196.0		4.0	196.0	1	1	1.		4.0	
C5110		2.7	14.0		23.9	126.0	9	1	9.		23.9	
C5200		3.8	4.0		3.8	4.0	1	1	1.		3.8	
C5320		8.2	162.0		65.3	1296.0	8	1	8.		65.3	
C5400		7.0	150.0		13.9	300.0	2	1	2.		13.9	
C5410		9.0	131.0		9.0	131.0	1	1	1.		9.0	
C5820		25.0	353.0		100.0	1412.0	4	1	4.		100.0	
C5870		4.3	38.0		4.3	38.0	1	1	1.		4.3	
C5930		2.8	100.0		2.8	100.0	1	1	1.		2.8	
C6130		6.3	246.0		6.3	246.0	1	1	1.		6.3	
C6140		.2	7.0		.2	7.0	1	1	1.		.2	
C6220		.5	5.0		1.5	15.0	3	1	3.		1.5	
C6260		11.0	150.0		11.0	150.0	1	1	1.		11.0	
C6290		.1	4.0		.1	4.0	1	1	1.		.1	
C6370		6.3	107.0		6.3	107.0	1	1	1.		6.3	
C6388		5.9	140.0		11.7	280.0	2	1	2.		11.7	
C6390		7.2	257.0		57.4	2056.0	8	1	8.		57.4	
C6400		126.0	2136.0		126.0	2136.0	1	2	1.		126.0	
C6410		18.0	330.0		90.0	1650.0	5	1	5.		90.0	
C6490		1.5	62.0		10.5	434.0	7	1	7.		10.5	
C6510		6.9	90.0		6.9	90.0	1	1	1.		6.9	
C6650		50.0	300.0		50.0	300.0	1	1	1.		50.0	
C6655		.1	1.0		.4	8.0	8	1	8.		.4	
C6658		.1	1.0		.1	1.0	1	1	1.		.1	
C6684		.0	1.0		1.0	103.0	103	1	103.		1.0	
D0070		1.4	28.0		1.4	28.0	1	2	1.		1.4	
D0090	38.0		1054.0	38.0		1054.0	1	2	1.	38.0		
D0100		20.0	163.0		20.0	163.0	1	2	1.		20.0	
D0170		4.0	517.0		4.0	517.0	1	1	1.		4.0	
D0380		.5	16.0		.5	16.0	1	2	1.		.5	
D0390		1.4	21.0		1.4	21.0	1	2	1.		1.4	
D0400		.5	16.0		.5	16.0	1	2	1.		.5	
D0410		.6	16.0		.6	16.0	1	2	1.		.6	
D0725		125.0	1832.0		125.0	1832.0	1	2	1.		125.0	
D0740		35.8	710.0		35.8	710.0	1	2	1.		35.8	
D0840	46.0		570.0	1196.0		14820.0	26	4	18.	847.6		8.
D0860	96.0		2750.0	96.0		2750.0	1	4	1.	96.0		
D0880	93.0		2710.0	186.0		5420.0	2	4	2.	179.7		
D0890	71.0		2780.0	71.0		2780.0	1	2	1.	71.0		
D1030	176.0		12560.0	528.0		40980.0	3	4	2.	424.2		1.
D1130	18.0		900.0	540.0		27000.0	30	4	23.	414.4		7.

CONSTRAINED T/E FOR UNIT M8625

FORWARD AIR DEFENSE BATTERY, MACG, MAW

CURTATE T/E FOR CLASS VII, CLASS II TAM ITEMS

CUBE OF PUBLISHED T/E IS 3280.58 CU FT
CONSTRAINED TO 75.0 PCT OR 2460.00 CU FT

SQUARE OF PUBLISHED T/E IS 4311.00 SQ FT
CONSTRAINED TO 75.0 PCT OR 3233.00 SQ FT

TAM	ITEM SQUARE	ITEM CUBE	ITEM WEIGHT	T/E SQUARE	T/E CUBE	T/E WEIGHT	T/E QTY	CRIT	*****REDUCED T/E***** QTY	SQUARE	CUBE	DEFIC-IENCY
D1160	61.0		2400.0	1586.0		62400.0	26	4	18.	1092.1		8.
D1250		.0	2.0		.0	2.0	1	1	1.		.0	
E0090		.4	7.0		32.0	574.0	82	1	65.		25.2	17.
E0210		.0	1.0		1.0	98.0	98	1	98.		1.0	
E0590		7.0	71.0		1050.0	10650.0	150	1	91.		637.2	59.
E3195		0.0	0.0		0.0	0.0	15	1	15.		0.0	
GRAND TOTALS				4311.0	3280.6	206262.0	1265		1068.	3233.0	2460.0	

TODAYS DATE 03/02/76
OR INDEX(SQUARE) = 74.10
OR INDEX(CUBE) = 85.56
OR INDEX(TOTAL T/E) = 83.51

Appendix D

A MODEL TO COMPUTE AMPHIBIOUS LIFT FOR A VARIABLE DAY OF SUPPLY FROM THE F-2 JOPS CARD

Appendix D

A MODEL TO COMPUTE AMPHIBIOUS LIFT FOR A VARIABLE DAY OF SUPPLY FROM THE F-2 JOPS CARD

I INTRODUCTION

The automated output from the MAGTF Program is a card image file consisting of the JOPS formatted F-1, F-2, and F-3 cards. The MAGTF Program was written to include mountout cargo in certain of the F-2 cards as a function of the inputed days of supply (DOS). The term DOS is defined in the MAGTF System to be the days of supply for the MAGTF run under preparation. The MAGTF of MAF size is divided into the assault echelon (AE) and the assault follow-on echelon (AFOE). The term DOS applies to the AFOE allowing another parameter to designate AE days of supply. This parameter is called assault echelon days of supply (AEDOS), and its value may be less than equal to DOS (it is usually less than the DOS). The JCS specification for the F-2 card requires the mountout computation to be for a DOS value of 30 in all units of the MAF, and requires AEDOS to have the value 30 also. In an actual operation, AEDOS can be less than DOS, so the MAGTF Program permits the DOS parameter to be variable and therefore to take on a value assigned by the user. If the user plans to submit the JOPS cards from a MAGTF run, DOS must be set at 30. When the AEDOS is less than DOS, it becomes necessary to convert the mountout cargo on the F-2 cards for AE units from DOS to AEDOS. This conversion was necessary in order to utilize the existing automated output of the MAGTF System in the current study. In summary, a mathematical model was required to convert mountout cargo quantities, based on DOS, contained on the F-2 card to an amount based on AEDOS.

This model provides the conversion for bulk stowed cargo in units of the measurement ton and for square loaded cargo in units of square feet. This appendix explains the model used in the TFEIN Program within CALAS in order to provide an understanding of the source of all data used in the study. The CALAS model is explained in Section VI.

II THE MODEL FOR BULK LOADING

The MAGTF System provides data by unit load and landing force supply for each unit in a MAGTF. The F-2 card of the JOPS Deck for mountout contains an amount specified for landing force supply only. The algorithm presented here pertains only to that portion of mountout contained in landing force supply.

Let:

T = The cube of mountout in landing force supply based on the value of DOS

d = The value of DOS.

If d is greater than 30,

$$T = T_1 + T_2$$

where

T_1 = Cube of materiel whose value is computed from the assault rate in the MAGTF Program for the first 30 days

T_2 = Cube of materiel whose value is computed from the sustained rate for DOS greater than 30, i.e., for (DOS - 30) days

γ = Proportion of mountout computed for the first 30 days.

Then:

$$T_1 = \gamma T$$

$$T_2 = (1-\gamma)T.$$

If:

$f(a_k)_j$ = A function in the MAGTF Program computing the cube of mountout for the kth class of supply for the jth unit for $d = 1$

d_a = The DOS for the AEDOS ($d_a \leq 30$)

d_u = The DOS for mountout

a_{ij} = Allowance of ith TAM item of the jth unit

x_i = Cubic feet of the ith TAM item

s_{ij} = Allowance of ith TAM item of the jth unit for square loaded items

z_i = Square feet of the ith TAM item,

then

$$T = \begin{cases} (30-d_a) \sum_{k=1}^{9} f(a_k) + (d-30) \sum_{k=1}^{9} f(a_k); \; d > 30 \\ d \sum_{k=1}^{9} f(a_k); \; d \leq 30. \end{cases} \tag{1}$$

Since T is known for the DOS minus the DOS carried in the unit load, it is necessary to find the mountout for the DOS in the landing force supply carried by the AE.

For certain items:

$$f'(a_k) = \sigma f(a_k) \tag{2}$$

when $\sigma = .5$. There are TAM items that do not have an assault rate different from the sustaining rate when $\sigma = 1$. The assumption is made that all items do have an assault rate when $\sigma = .5$. A slight error occurs from this assumption for those items that do not have an assault rate. Substituting equation (2) into (1) gives:

$$\sum_{k=1}^{9} f(a_k) = \frac{T}{(1-\sigma)(30-d_a)} \qquad (3)$$

the mountout for one DOS. Finally, the desired value for mountout contained in landing force supply for the AE at $(d_a - d_u)$ DOS is given by:

$$T_1 = \frac{\gamma(d_a - d_u)T}{(1-\sigma)(30-d_a)} . \qquad (4)$$

Certain classes of supply are not affected by an assault rate for which the first 30 days are greater than the second. For this materiel an expression to convert mountout computed from $(d-d_u)$ DOS to $(d_a - d_u)$ DOS carried in landing force supply is given by:

$$T_2 = \frac{(1-\gamma)(d_a - d_u)T}{(d-d_u)} . \qquad (5)$$

Combining equations (4) and (5) an expression for $(d_a - d_u)$ DOS carried in landing force supply in the AE for the jth unit is:

$$T_j' = (d_a - d_u) \frac{\gamma}{(1-\sigma)(30-d_a)} + \frac{(1-\sigma)}{(d_a - d_u)} \sum_{\ell=1}^{P} T_\ell , \qquad (6)$$

where P is the number of F-2 JOPS cards containing mountout data for the jth unit. Equation (6) is used in the TFEIN Program to convert mountout in the JOPS cards to the desired DOS.

The value for γ was obtained from the AE summary of the MAGTF listing by summing the cubic feet of materiel from supply classes having an assault rate and dividing by total mountout. Supply classes II, V, VII fall in this category.

III THE MODEL FOR SQUARE LOADING

Using exactly the same technique, mountout of square loaded items is converted to the desired DOS. Equations for this conversion are simplified by being involved with only supply class VIIW.

If S_ℓ is the square feet of a group of square loaded items, mountout can be computed by:

$$S_j' = \frac{(d_a - d_u)}{(1-\sigma)(30-d_a)} \sum_{\ell=1}^{P} S_\ell \ . \tag{7}$$

IV COMPUTING ALGORITHM

Now that the algorithm for computing mountout is available, the method used to obtain the lift expression for the AE and AFOE can be written by:

$$L_A = \sum_{j=1}^{M} \sum_{i=1}^{N_j} a_{ij} x_i + d_u \sum_{k=1}^{9} f(a_k)_j + T'_j \tag{8}$$

for bulk cargo in measurement tons

$$S_A = \sum_{j=1}^{M} s_{ij} z_i + d_u \sum_{i=1}^{N_j} c_i s_{ij} z_i + S'_j \tag{9}$$

for the AE, and

$$L_F = \sum_{j=1}^{M'} \sum_{i=1}^{N_j} a_{ij} x_i + d_u \sum_{k=1}^{9} f(a_k)_j + T_j \tag{10}$$

for bulk cargo, and

$$S_F = \sum_{j=1}^{M'} s_{ij} z_i + d_u \sum_{i=1}^{N'_j} c_i s_{ij} z_i + S_j \tag{11}$$

for the AFOE. It should be emphasized that T_j and S_j are summed values taken from the JOPS cards designated for landing force supply. This cargo is mountout for $(d-d_u)$ DOS. These values are calculated by:

$$T_j = \sum_{\ell=1}^{P} T_\ell \tag{12}$$

$$S_j = \sum_{\ell=1}^{P} S_\ell,$$

where

P = Number of JOPS cards for landing force supply in the AFOE

M = Number of units in the AE

N_j = Number of TAM items in the jth unit

N' = Number of square loaded TAM items on the jth unit.

V PROGRAM TFEIN

The TFEIN Program punches a card containing total personnel, barrels of bulk fuel, L_A, S_A, L_F, and S_F. The format of this card is the type 9 input of the TFE Program. This card is the movement requirement for the TFE Program. It is also used as one of the inputs to the Constrained Cargo Factoring Model. Appendix E explains this model and uses as its prime input the type 9 card. It is the values for L_{Aj} and S_{Aj} for each unit that must be factored into specific supply class categories before it is possible to apply constraints to unit cargo categories in a realistic manner. A description of Program TFEIN is given in the following paragraphs.

The initial design of Program TFEIN was to provide an interface between the JOPS card file containing the cargo requirements for individual units of the AE and AFOE and the additional data requirements for the transportation simulation provided by the TFE Program. Program TFEIN requires considerable data preparation for the transportation aspect of the output data and different data preparation necessary to modify JOPS data for the specific use of stating lift requirements for each unit. This program reads from card sources, accumulates lift requirements for the unit, performs the necessary modifications, combines all necessary data for the type 9 format, and punches and writes the type 9 output format for each unit. This program is included in CALAS as it currently exists. If a system such as CALAS is implemented, this program would be replaced by a similar program that prepared data obtained directly from Program MAGTF, thus providing all inputs to the Constrained Cargo Factoring Model without the manual interface required from the present programs that use JOPS card input.

Figure D-1 contains the flow chart for the TFEIN program. The following explanation refers to that figure. The program begins by initializing all parameters and reading all card input files. A value for unused mobile loading capacity is entered by card to provide the basis of reallocating a part of this unused capacity to all units of the AE. This calculation simulates the loading of all vehicles with mobile loaded cargo. A card deck is read providing the type 9 noncargo data elements. This information is placed in an array as a look-up table for use later in the program. An additional deck is read that provides unit mobile loaded cargo. This data is necessary because JOPS data includes cargo that would have been mobile loaded. The movement requirement, however, does not include mobile loaded cargo. The data source for this deck is the MAGTF listing for each unit of the AE.

When TFEIN is run for AE units, the conversion factor, explained earlier in this appendix, must be computed. This factor converts mount-out from 55 DOS to 10 DOS for AE units. The AFOE version of the program excludes this section of the code. The mobile loading reallocation factor is computed. This factor reduces the movement requirement uniformly among units of the AE.

The next section of code executes for each unit of the input JOPS file. The JOPS cards are read one at a time and processed before the next card is read. When all cards for one unit are processed, totals for bulk cargo, square loaded items, bulk fuel, and passengers are obtained. The output files are written for that unit, then the next unit's cards are processed. As each card is read, it is checked to determine if the last card image of the file has been read. If the last card has been processed, the program branches to 3. If not, the program determines if the card is F-1, F-2, or F-3 format and branches to the 5, 6, or 7 control points for further execution. The F-1 card provides the UTC for unit identification and the number of passengers. The program terminates reading JOPS cards

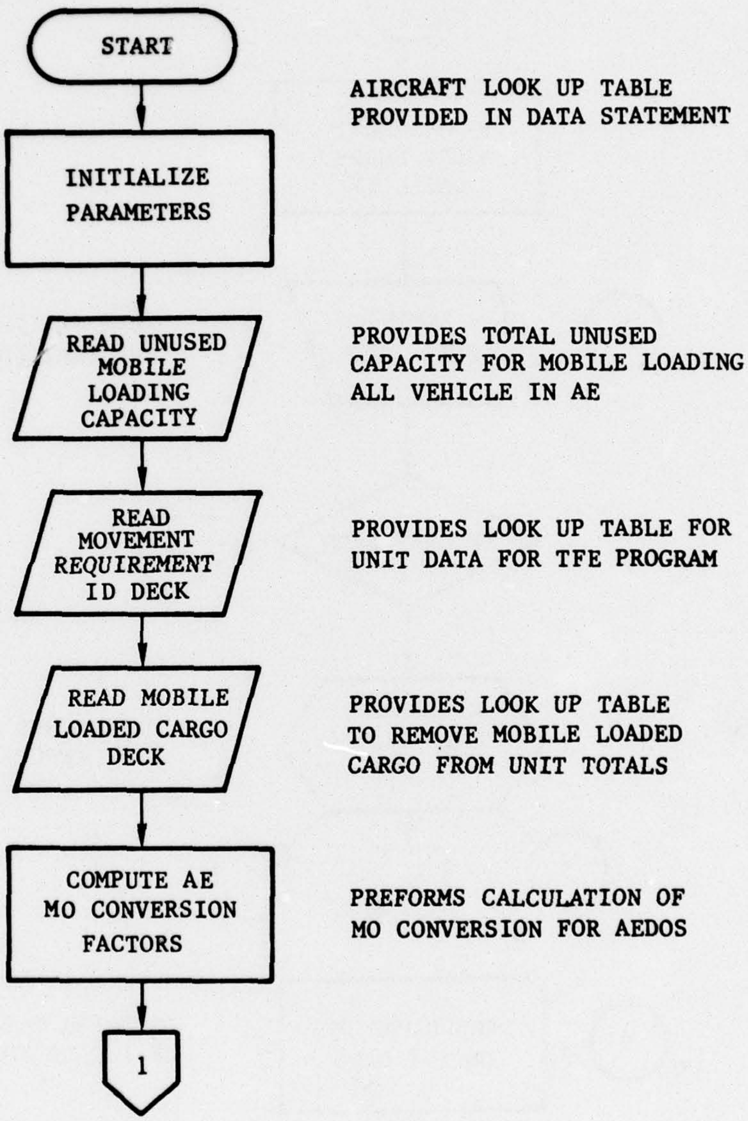
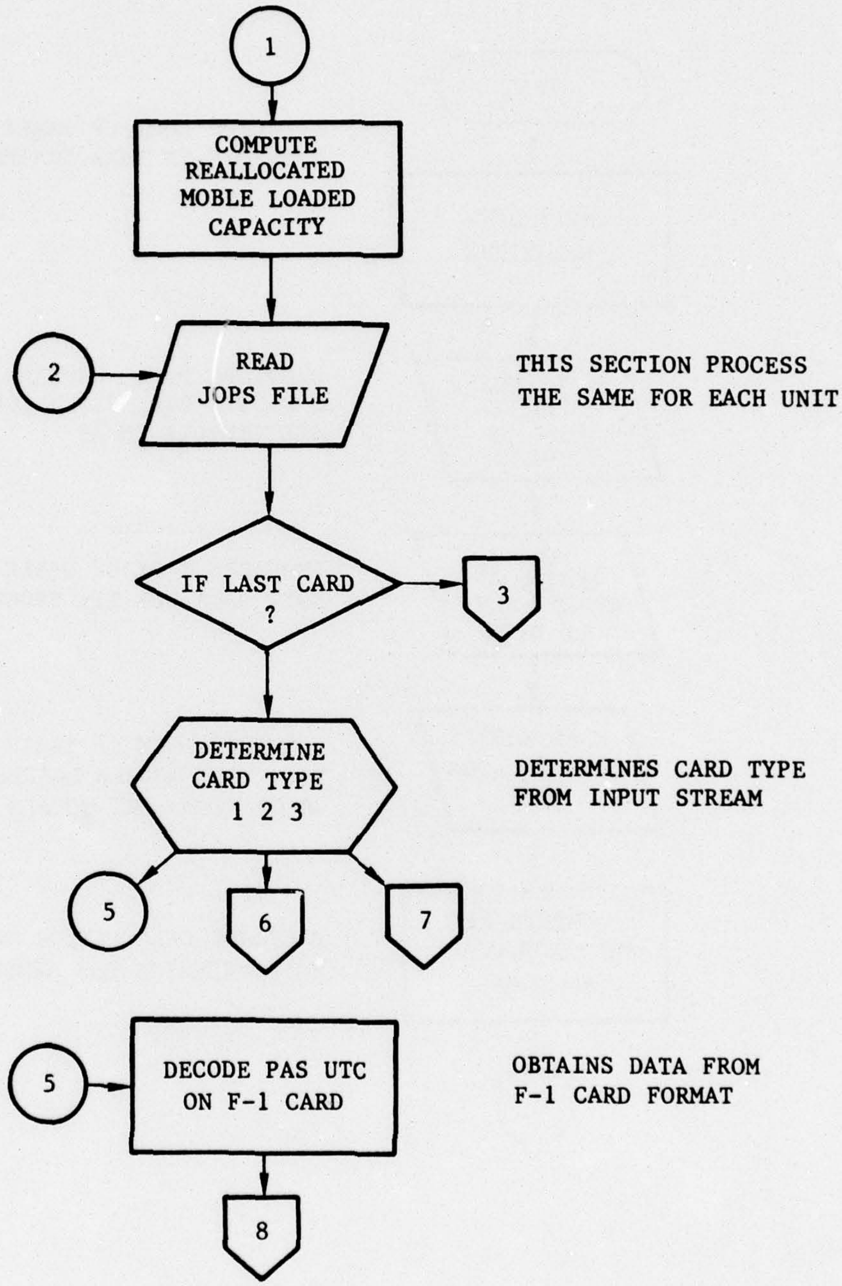
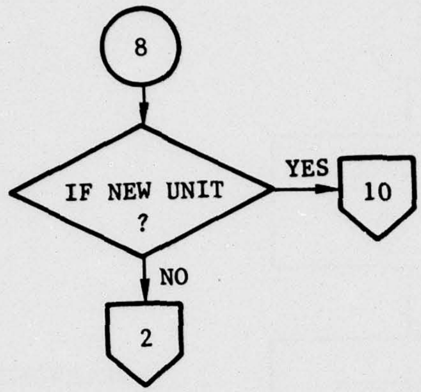
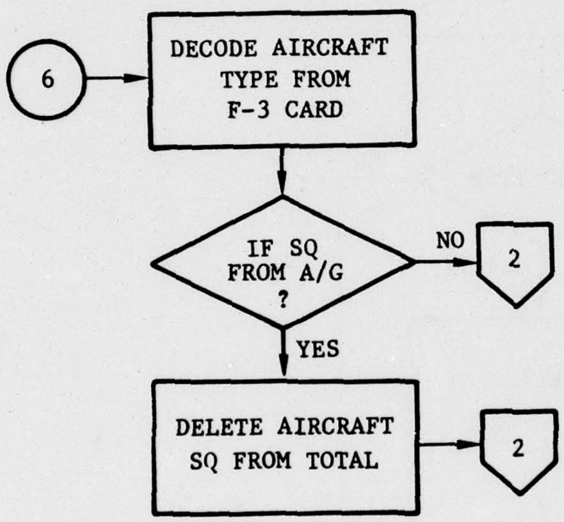


FIGURE D-1. PROGRAM TFEIN

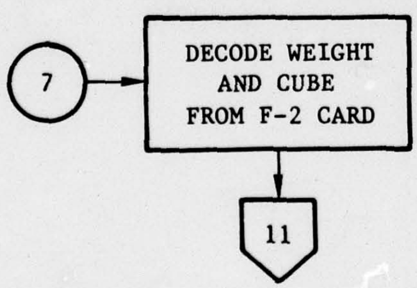

1
COMPUTE REALLOCATED MOBLE LOADED CAPACITY
2
READ JOPS FILE
THIS SECTION PROCESS THE SAME FOR EACH UNIT
IF LAST CARD ?
3
DETERMINE CARD TYPE 1 2 3
DETERMINES CARD TYPE FROM INPUT STREAM
5
6
7
5
DECODE PAS UTC ON F-1 CARD
OBTAINS DATA FROM F-1 CARD FORMAT
8



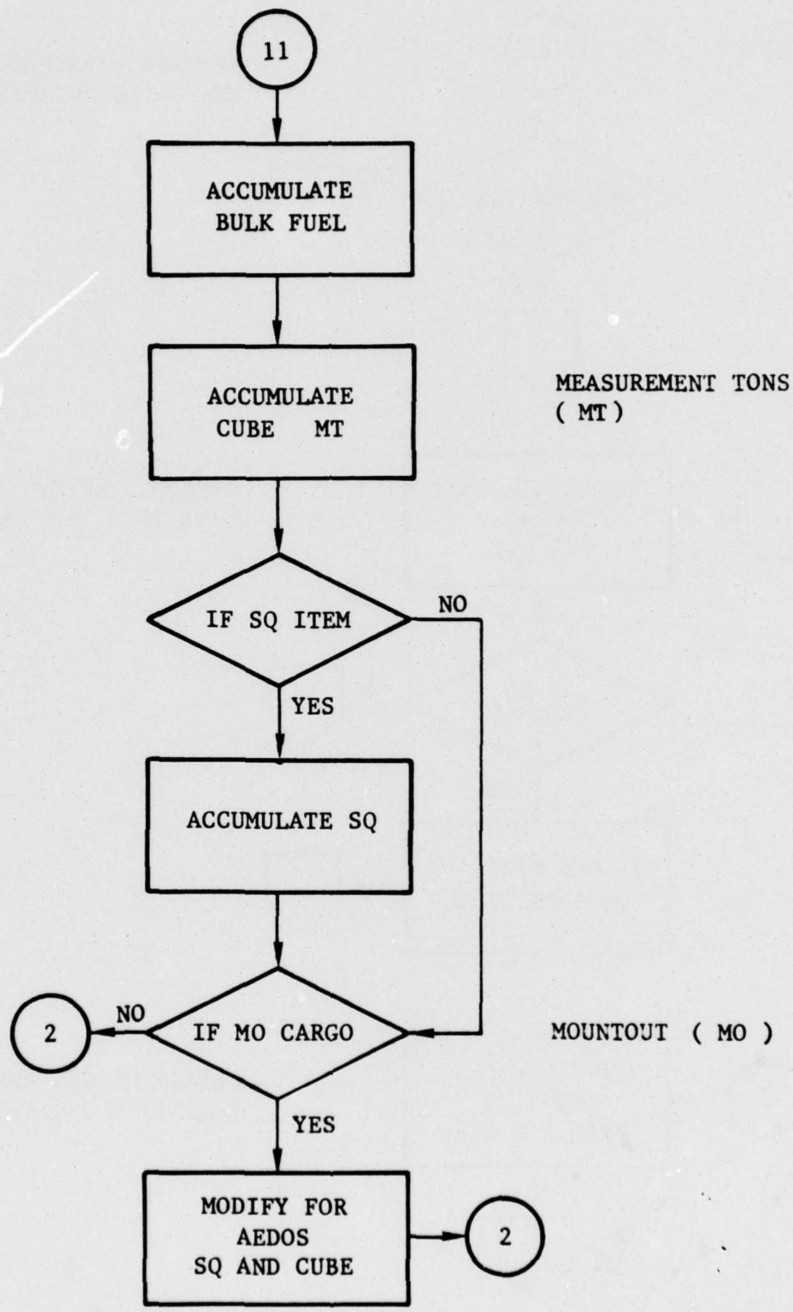
PROGRAM BRANCHES WHEN NEW F-1 CARD APPEARS

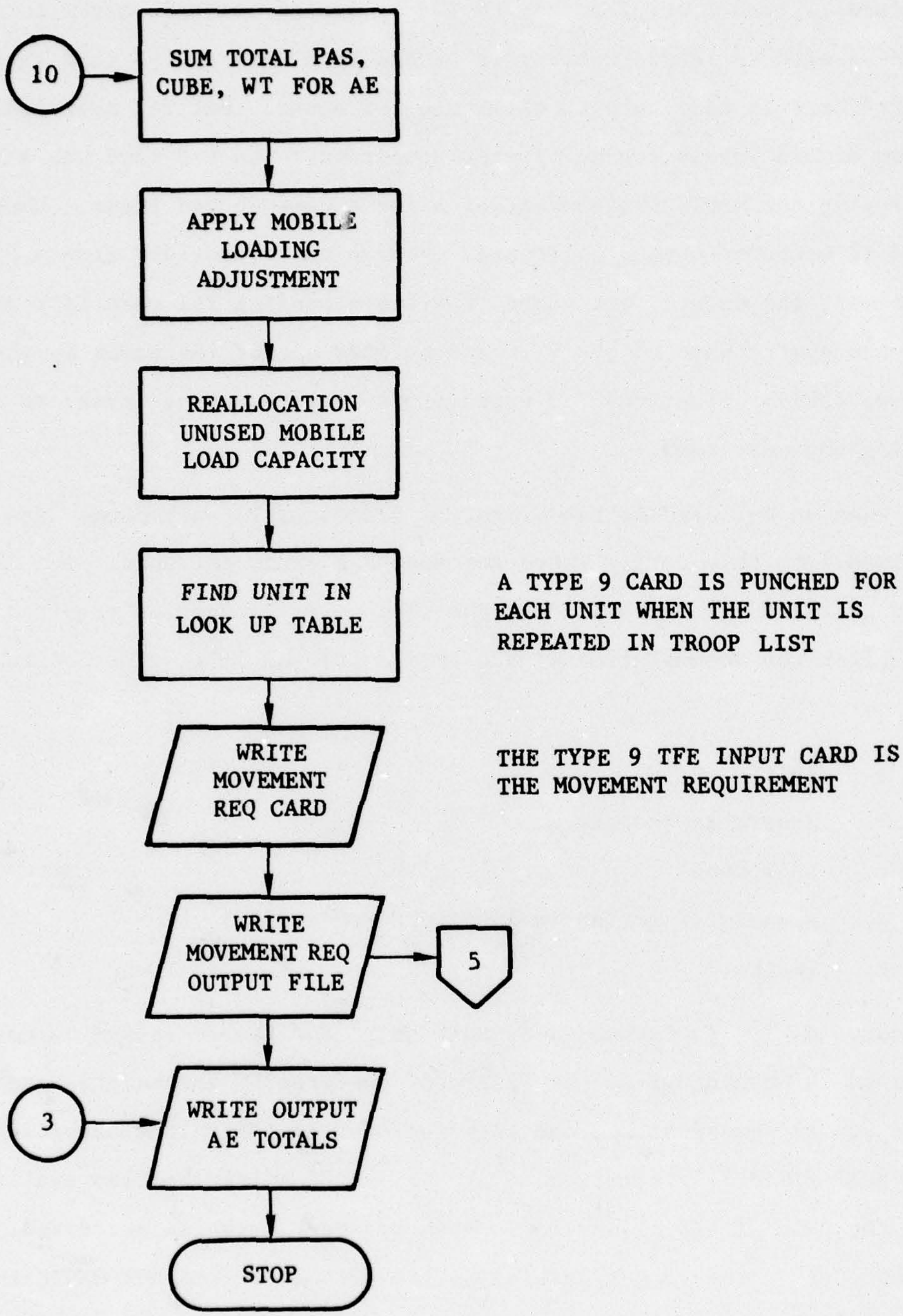


OBTAIN AIRCRAFT SQ DATA FROM F-3 CARD



OBTAIN WEIGHT AND CUBE DATA FROM F-2 CARD


11
ACCUMULATE BULK FUEL
ACCUMULATE CUBE MT
MEASUREMENT TONS (MT)
IF SQ ITEM
NO
YES
ACCUMULATE SQ
IF MO CARGO
NO
2
MOUNTOUT (MO)
YES
MODIFY FOR AEDOS SQ AND CUBE
2


10
SUM TOTAL PAS, CUBE, WT FOR AE
APPLY MOBILE LOADING ADJUSTMENT
REALLOCATION UNUSED MOBILE LOAD CAPACITY
FIND UNIT IN LOOK UP TABLE
A TYPE 9 CARD IS PUNCHED FOR EACH UNIT WHEN THE UNIT IS REPEATED IN TROOP LIST
WRITE MOVEMENT REQ CARD
THE TYPE 9 TFE INPUT CARD IS THE MOVEMENT REQUIREMENT
WRITE MOVEMENT REQ OUTPUT FILE
5
3
WRITE OUTPUT AE TOTALS
STOP

for each unit when the next unit's F-1 card is read. If the next unit's F-1 card is read control passes to 10, otherwise control passes to 2 and the next card is read. Control is passed to 6 when an F-3 card is read. The F-3 card is used only to eliminate the square feet for helicopters in the square totals for helicopter squadrons. The F-3 card has a field containing the MAGTF system name of major square loaded items. When the field is compared with a helicopter look-up table provided from a DATA statement, the square feet added from the preceding F-2 card is removed when the system name on the F-3 card matches one of the names in the look-up table. After the F-3 card is processed, control passes to 2 for reading the next card.

When an F-2 card is read, control passes to 7. All cargo data is obtained from this card. There are many F-2 cards per unit. The CRCAT field of the F-2 card identifies the five cargo categories required to accomplish the accumulation of the totals for the unit. These categories are:

a. Bulk cargo
b. Square loaded cargo
c. Bulk fuel
d. Mountout (carried in landing force supply)
e. Weight.

Category d is also composed of bulk cargo and square loaded cargo. After the data is obtained from the F-2 card, the program accumulates the bulk cargo square loaded cargo, and bulk fuel for the unit load according to the CRCAT field. Information on air transportability is also available from the CRCAT field if desired. When mountout cargo is processed, it is converted from the 55 DOS carried on the JOPS card from the MAGTF input parameters to the 10 DOS desired for AE units. This conversion feature is not used when processing AFOE units. After all data is processed from the F-2 card, control is passed back to 2 for reading the next JOPS card.

As previously stated, when the F-1 card for the next unit is read, control is passed to 10, where final processing for the current unit is accomplished. A total for the AE is obtained by adding unit totals together as they are computed. The mobile loaded cargo is subtracted, as well as the additional mobile loaded cargo capacity available to each unit from unit total bulk in measurement tons. The program then locates the current unit in the unit look-up table and combines cargo data with movement data required for the type 9 TFE input format. This format is then written to the output file and punched on cards for use as input to the TFE program and the AMPSF program, containing the Constrained Cargo Factoring Model of CALAS.

After the output statements have been executed, control passes to 5 and the F-1 card of the next unit just read is processed. If no further cards are contained in the file, control passes to 3 and the MAGTF totals are written to output and the program terminates.

Appendix E

CONSTRAINED CARGO FACTORING MODEL

Appendix E

CONSTRAINED CARGO FACTORING MODEL

I INTRODUCTION

During the 1975-1980 time frame, the lift capacity of amphibious assault ships available to support a MAGTF of MAF size is expected to be less than the lift requirement of the assault echelon of the MAF. The extent of the amphibious lift short fall is presented in Section IV of this report. Section V provides an explanation of the nature and composition of landing force materiel. Familiarity with the information in Section V will be helpful in understanding the model presented in this appendix.

Each unit included in the troop list of the MAF has a lift requirement consisting of the nine classes of supply. This materiel is separated into the unit load and landing force supply. The unit load consists of the initial issue of supply classes II and VII, also known as the materiel specified by the table of equipment (T/E) and a specified number of days of supply (DOS) of all nine classes of supply called mountout. Therefore, the unit load consists of T/E, and for this project, five DOS of mountout. In addition, each unit generates a specified number of DOS of mountout to be included in landing force supply. The total mountout accompanying the AE is the 5 DOS in unit load and 10 DOS landing force supply, for a total of 15 DOS. The total DOS of mountout for the MAF is 60. The AFOE must also lift 45 DOS of mountout for the AE.

When the unit is prepared for loading it consists of four categories of requirements to be met by the amphibious assault ship capacity.

These are:

(1) Personnel

(2) Bulk fuel (barrels)

(3) Bulk cargo (measurement tons, i.e., 40 cubic feet per measurement ton)

(4) Square loaded cargo (square feet).

It has been determined during the course of this study that no constraint exists for either personnel or bulk fuel. These lift requirements are therefore excluded from the following analysis. The lift requirements of interest are bulk cargo and square loaded cargo. Based on ship loading techniques currently in effect, the Constrained Cargo Factoring Model loads bulk cargo and square loaded cargo separately into the spaces of assault shipping. The model permits loading of bulk cargo into square spaces by a conversion factor that assumes bulk cargo will be stowed two pallets high (or 80 inches). No square loaded items are loaded into spaces designated for bulk cargo. Broken stowage factors of .8 for bulk and .75 for square are assumed for the model. When preloading boats of the Assault Craft Unit, Naval Beach Group, with square loaded items, a broken stowage factor of .65 is assumed.

When considering a reduction of materiel from units, it is necessary to plan the reduction from precise cargo categories. Reductions must be made from bulk cargo separately, as distinguished from square loaded cargo, although these categories are not necessarily independent from the viewpoint of unit integrity. Variable parameters controlling model operation provide a means of interreacting the reductions of bulk and square loaded cargo. This effect will be explained later.

There are two methods of reducing unit lift requirements. These are a reduction in the unit T/E and the reduction of DOS determining mountout. It should be pointed out that these reduction methods assume

that the planning factors specifying mountout for 1 DOS will remain constant. Examining bulk cargo reveals that reductions will have to be made from supply classes II and VII nonsquare, which comprise the unit's T/E, and/or by reducing the DOS of nine classes of supply from 15 DOS of mountout. For square loaded cargo, reductions must occur for class VII square loaded T/E items and by reduction of DOS for mountout affecting only supply class VII square. The rationale for the procedure of employing this model is contained in Section VI of this report.

The Constrained Cargo Factoring Model is a simple mathematical procedure that uses lift data for individual units to factor the lift requirement provided as input into categories which represent the specific materiel that is logically reduced when a unit is not able to load all of its materiel into assigned assault shipping spaces. The model applies a specified constraint to the total cube of the unit's T/E, i.e., effects a percentage reduction, loads the ship with the reduced T/E requirement, reduces the DOS of bulk mountout (if specified), loads the mountout, repeats this process for each unit, determines if the assault shipping is available, and generates a short fall or an excess. The model also performs the same functions for square loaded cargo.

For each constraint, the model provides a list of all units containing the original bulk and square and the cargo values permitted under the active constraint. If the model determines that an excess of square storage space exists, it reallocates the excess square to bulk space and reloads the units.

This appendix provides a mathematical explanation of the model. It must be understood that the model is a subsystem of CALAS and does not function in isolation. It primarily provides the data for the Constrained T/E Embarkation Analysis Model, which determines the optimal mix of the T/E under constrained loading conditions.

II INPUT

There are three input sources for the Cargo Factoring Model. This paragraph presents an explanation and notation to be used in defining the model input. The principal input sources are:

(1) The movement requirement comprised of bulk and square loaded cargo

(2) Cargo factor file

(3) Amphibious assault ship lift characteristics.

A variety of values for the constraints are required inputs, but are changed as desired by the user.

Appendix D provides an explanation of the source of the cargo movement requirement that are input to the Constrained Cargo Factoring Model. That input was defined for the AE to be:

$$L = \sum_{j=1}^{M} \sum_{i=1}^{N_j} a_{ij} x_i + d_u \sum_{k=1}^{9} f(a_k) j$$

$$+ (d_a - d_u) \left[\frac{\gamma}{(1-\sigma)(30-d_a)} + \frac{(1-\sigma)}{(d_a - d_u)} \right] \sum_{\ell=1}^{P} T_\ell \qquad (1)$$

for bulk cargo, and

$$S = \sum_{j=1}^{M} s_{ij} z_i + d_u \sum_{i=1}^{N_j} c_i s_{ij} z_i$$

$$+ \frac{(d_a - d_u)}{(1-\sigma)(30-d_a)} \sum_{\ell=1}^{P} S_\ell \,, \qquad (2)$$

where:

$f(a_k)_j$ = a function in the MAGTF Program computing the cube of mountout for the kth class of supply for the jth unit for d = 1

d_a = the DOS for the AE

d_u = the DOS for mountout

a_{ij} = allowance of lth TAM item of the i unit

x_i = cubic feet of the ith TAM item

γ = proporation of mountout computed for the first 30 DOS

σ = adjusting factor for mountout computations for DOS > 30

s_{ij} = allowance of ith square loaded item for jth unit.

Equations (1) and (2) show how the movement requirement is determined from the F-2 JOPS card. The values for L and S can be written:

$$S_j, L_j = \text{(T/E equipment)} + d_a \text{ (mountout for 1 DOS)}$$

for the jth unit, or

$$L_j = \sum_{i=1}^{N_j} a_{ij} x_i + d_a \sum_{k=1}^{9} f(a_k)_j, \tag{3}$$

and

$$S_j = \sum_{i=1}^{N_j'} s_{ij} z_i + \frac{d_a}{30} c_i s_{ij} z_i, \tag{4}$$

where

c_i = combat active replacement factor for 30 DOS.

The movement requirement for each unit of the AE is available for input to the model by a card file in the format of the type 9 card used by the TFE Model. A description of this format can be found in the "FMF TFE Users Manual." The same card is used in both the TFE and Constrained Model's computer programs. The essential data elements are:

(1) Bulk cargo in measurement tons

(2) Square loaded items in square feet

(3) Personnel

(4) Bulk fuel in barrels carried in a miscellaneous cargo category field.

Only the bulk and square loaded cargo categories are used by the Constrained Model.

Since the automated data mode available to the model is in the configuration for loading of ships, i.e., bulk and square loaded cargo, it is necessary to factor the cargo requirements into other cargo categories, thus facilitating the systematic and logical reductions for each unit. Basically, the cargo must be factored into T/E and mountout, permitting the application of a constraint to the T/E and a reduction to the DOS for mountout. Additionally, it was necessary to have supply classes II and VII of mountout factored in order to permit an investigation of the effect on amphibious lift short fall of applying a different combat active replacement factor to mountout calculations. The following variables are provided by factor cards which are used to conduct factoring operations within the model:

t_e = T/E items in measurement tons (MT)

T_m = Mountout supply classes I, V, VI VII, IX in MT

L_m = Total bulk cargo from MAGTF listing

t_s = Mountout supply classes IIW and VIIW in square feet

t_{as} = Initial issues, plus 90 days mountout supply class VIIA in square feet

t_{ae} = Initial issues, plus 90 days mountout supply classes IIA and VIIA nonsquare in MT

b_f = Bulk fuel in cubic feet

L_u = Supply class IX part of unit materiel in MT

L_s = Supply class IX computer for equipment in the unit but carried by third and fourth echelon maintenance units.

A factor card is available for each complete unit in the AE. The card contains values for each factor shown above, obtained from MAGTF listings. It should be noted that the detailed application of constraints to unit cargoes would not be possible without the specific cargo categories provided by the MAGTF Program. It was assumed that detachments are prepared for deployment containing only essential equipment. No constraints are applied to these units and no factor cards were prepared.

The cargo capacity provided by the amphibious assault ships has been made available to the model by a card image file. There are two cards for each ship in the force designated to lift the AE of the MAF. The format of this card file is the type 8 input card of the TFE Program. These cards serve as input to both the TFE and Constrained Cargo Factoring Model's computer programs. The essential data elements on the cards required by the constrained model are:

(1) Bulk capacity in measurement tons

(2) Personnel capacity

(3) Square loading capacity in square feet

(4) A miscellaneous capacity that may be designated a lift capacity such as bulk fuel or containers.

A description of the card format can be found in the HQFMF Pac "FMF TFE Users Manual."

III CARGO FACTORING PROCEDURE

The procedure used in this study to factor unit cargo into categories in order to apply constraints would not be used in a permanent computer assisted decision aid interactive system. The specific cargo categories needed to factor the movement requirement are available in the MAGTF Program in automated form after a unit has been processed. These values are included in the current unit listing generated from the program. A program change would be required to generate an output file on tape, disk, or cards, as desired, for use in the Constrained Cargo Factoring Model. This modification would eliminate the manual interface with the CALAS system now required to factor the cargo data. This MAGTF modification requirement was not identified prior to the last processing of the MAF. The time delays and additional costs that would have been generated by the modification did not justify the effort for the current study.

The procedure used herein is based on calculating the proportionate parts, as factors, of both bulk cargo and square loaded cargo for each cargo category, and applying these factors to the movement requirements generated by the TFEIN program, as explained in Appendix D. The scheme used is to factor the cargo totals into their parts, apply the constraints, and sum the reduced parts--thus obtaining the reduced movement requirement. The following notation will be used in the computing relationships presented below.

Let:

L_{mc} = Bulk cargo obtained from MAGTF listing corrected for supply class IX, supporting and cubic feet of bulk fuel

T_{mc} = Proportion of bulk cargo pertaining to mountout

τ = Proportion of supply class VIIA square used for IMA for the aviation unit

σ = An assigned constraint. The value is defined to be the proportion of the T/E to be loaded, i.e., $\sigma = 1$. There is no reduction. If $\sigma = .8$, a 20% reduction occurs

δ = Proportion of supply class IIA and VIIA nonsquare included on OMA for an aviation unit

η = Proportion of supply class VIIW square contained in mountout

d_u = A variable DOS for reducing the mountout within a units materiel

γ = A corrective factor for adjusting the combat active replacement factor.

Then:

$$L_{mc} = L_M - L_S - b_f, \tag{5}$$

providing an adjusted total bulk cargo. The relationship for the factored bulk cargo then becomes:

$$L' = \left(\frac{Lt_e}{L_{mc}} - L_s\right)\sigma + \left[\frac{(T_m - L_s - b_f) + t_s\gamma}{d_a L_{mc}}\right] Ld_v + \frac{\delta t_{ae} L}{L_{mc}} . \tag{6}$$

The first term of equation (6) factors the T/E items of cargo from the total bulk cargo obtained from the TFEIN Program and applies the constraint σ. The second term factors mountout from the bulk cargo by first removing class IX cargo carried by third and fourth echelon maintenance units and cubic feet of bulk fuel. Then supply classes IIW and VIIW are factored separately in order to apply the adjusting quantity

for a new combat active replacement factor. The variable d_v is also present to adjust the DOS for the AE if desired. The third term of equation (6) factors supply classes IIA and VIIA separately in order to remove from the AE IMA support from aviation units having aircraft. Also this portion of the cargo is unaffected by DOS. This procedure assumes IMA support will be provided by the LHA and LPH until arrival of the AFOE. The IMA factor can be set to one to include IMA with the AE if desired.

For square loaded items:

$$S' = \left[(S-t_{as})(1-\eta)\right]\sigma + \frac{(S-t_{as})\eta d_u}{d_a} + t_{as}\delta. \qquad (7)$$

In this equation the first term is the square loaded T/E items with the constraint σ applied. The second term is the portion of the total square contained in mountout. The value d_u provides the option of reducing the DOS for mountout of square loaded items. The third term adds the supply class VIIA square loaded items. The value for γ was obtained by sampling three aircraft squadrons to determine the porportion of class VIIA square that is IMA equipment. The sample revealed that γ was zero, indicating that all square loaded items are IMA and will not be included in the AE.

IV APPLICATION OF CONSTRAINTS

Having developed the cargo factoring procedure that permitted the application of constraints on the T/E, the model has been designed to weight the application of those constraints on the units of the AE. The weighted constraints are applied in a manner that indicates the sensitivity of the contribution of T/E items affected by the constraint to the accomplishment of the unit's mission and the mission of the AE of the MAF prior to arrival ashore of the AFOE about D+3 to D+7. Three different weights are applied. These different values for the constraints are computed as a function of one assigned value for the overall constraint. The weighted values are termed light, medium and heavy. The light constraint is defined to be one-half of the overall constraint; the medium constraint is equal to the overall constraint; and the heavy constraint is one and one-half times the overall constraint. Equations for these calculations are:

Light

$$\sigma' = .5(1 + \sigma) \tag{8}$$

Medium

$$\sigma' = \sigma \tag{9}$$

Heavy

$$\sigma' = 1.5\sigma - .5. \tag{10}$$

The assignment of weights to units can be found in Section VI.

Experience with this model gained from loading the AE of the MAF into the available shipping has revealed that, as a result of a smaller short fall of square loaded cargo than for bulk, a tradeoff exists

between the square and bulk cargo derived from obtaining additional bulk space by converting square space to bulk stowage resulting from applying constraints to square loaded items. The rationale for the application of this tradeoff is found in Appendix F. The model, therefore, provides a feature which converts unused square stowage space by the assumption of stacking bulk cargo two pallets high, computed by:

$$L_{cs} = \frac{80\ f_{bb}\ S_u}{12\ f_{bb}}, \tag{11}$$

where

L_{cs} = Converted square space to bulk

f_{bb} = Broken stowage factor for bulk, i.e., .8

f_{bs} = Broken stowage for square, i.e., .75

S_u = Excess square space.

This procedure is commonly used by Marine Corps embarkation planners and can be found in FMFM 4-2. (This reference uses 72 inches for the planned conversion.)

The procedure for computing the percent short fall used in the graphs of Section VII is to obtain the difference between the ship capacity and the constrained cargo in measurement tons, divide by the constrained cargo, and multiply by 100. The graphs are plotted as a function of the weighted constraints.

Let

C_{si} = capacity of the ith ship in square

C_{Bi} = capacity of the ith ship in bulk

B_j = bulk of the jth unit less T/E items

b_{tj} = bulk T/E of the jth unit

S_j = square cargo of the jth unit less the T/E

s_{tj} = T/E square of the jth unit

σ = weighted constraint

v = conversion factor for square to bulk

m = number of units

n = number of assault ships

P_{SF} = Percent short fall, then the percent short fall is computed by:

$$P_{SF} = \begin{cases} 100\left[\sum_{i=1}^{n} C_{Bi} + \left(\sum_{i=1}^{n} C_{si} - \sum_{j=1}^{m} S_j + \sigma\, s_{tj}\right)v - \sum_{j=1}^{m} B_j + \sigma b_{tj}\right] \Big/ \sum_{j=1}^{m} B_j + b_{tj} \\ \qquad ;\left(\sum_{i=1}^{n} C_{si} - \sum_{j=1}^{m} S_j + \sigma S_{ij}\right) \geq 0 \\ \dfrac{100\left[\sum_{i=1}^{n} C_{Bi} - \sum_{j=1}^{m} B_j + \sigma b_{tj}\right]}{\sum_{j=1}^{m} B_j + b_{tj}};\ \left(\sum_{i=1}^{n} C_{si} - \sum_{j=1}^{m} S_j + \sigma S_{tj}\right) < 0 \end{cases} \tag{12}$$

The graphs are plotted with P_{SF} versus σ from equation (12).

V COMPUTER PROGRAM

A computer program was written to perform the cargo factoring operation, apply the constraints to the T/E (or change the DOS for mountout), and perform the ship loading operation. The same operations must be performed on each unit of the AE, after which amphibious lift status is available for the ships contained in the input deck. This program has been labeled AMPSF. It is part of CALAS, as presented in Section VI of this report. The present section presents an explanation of a generalized flow chart of Program AMPSF. As explained in Section VII-F, the form of the Constrained Cargo Factoring Model, as it would be implemented in the FMF of the 1980s, would be different from the version developed during this study. If implementation of CALAS is required, computer documentation would be prepared at that time, describing the final version of all computer programs within that system.

A. Main Program

Figure E-1 is the generalized flow chart for Program AMPSF. The following explanation refers to the flow chart. The program consists of two routines: a main program AMPSF and the subroutine CONST. Routine AMPSF is programmed to execute once for each constraint planned for the analysis. A Do loop is set up to provide the continued execution. Values for the constraints are provided to the program in an array by Data Statement. In order to have the program execute exactly the same for each constraint, the input file, consisting of the card input decks, are written to the disk by control cards and then attached to the program before execution. Rewinding the disk file containing the input data decks alone after each execution of the program then becomes possible.

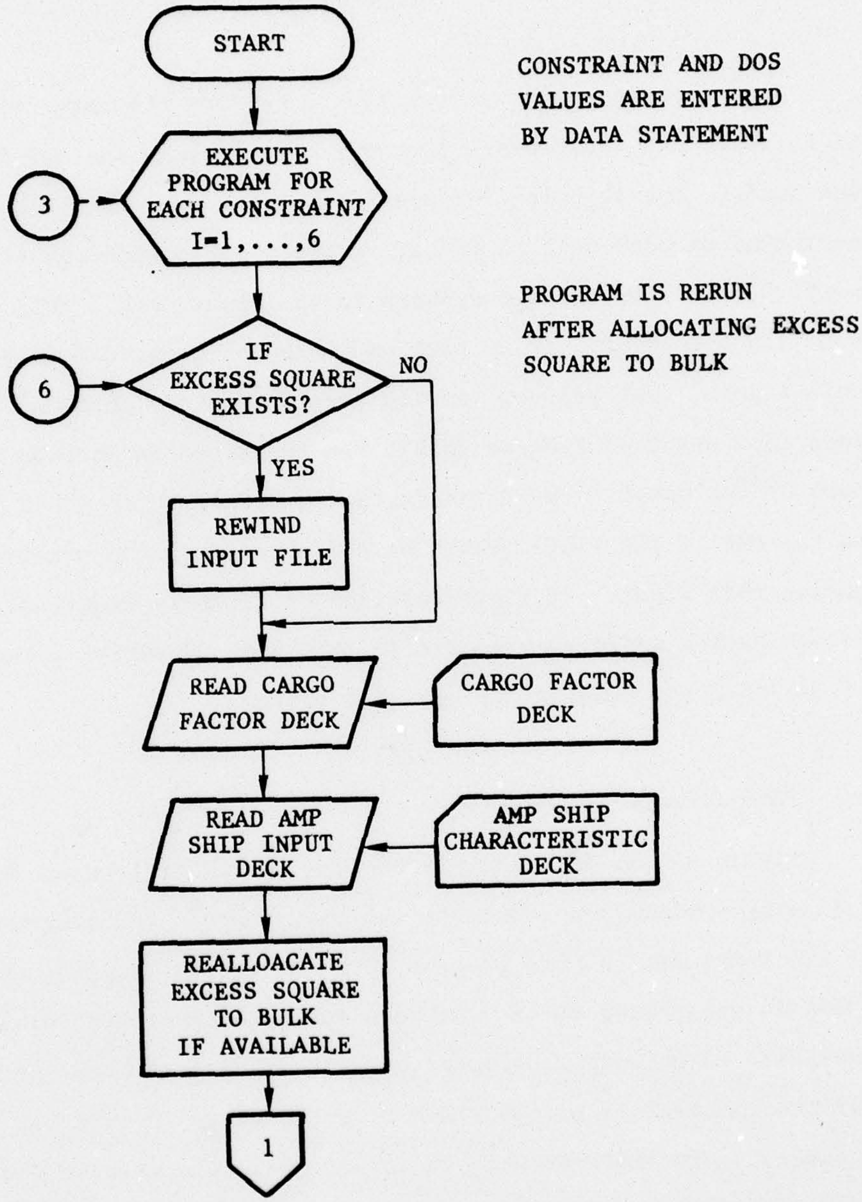
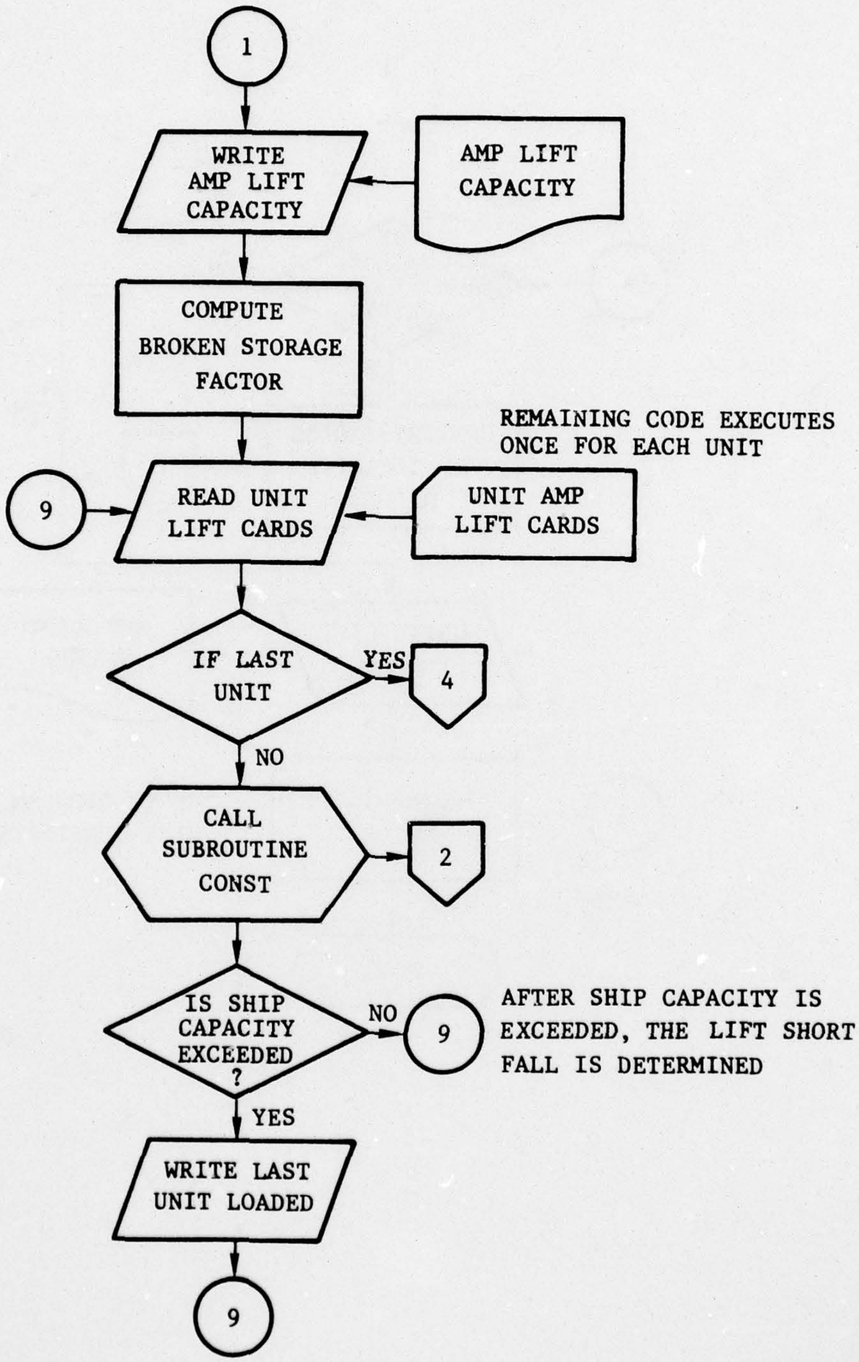
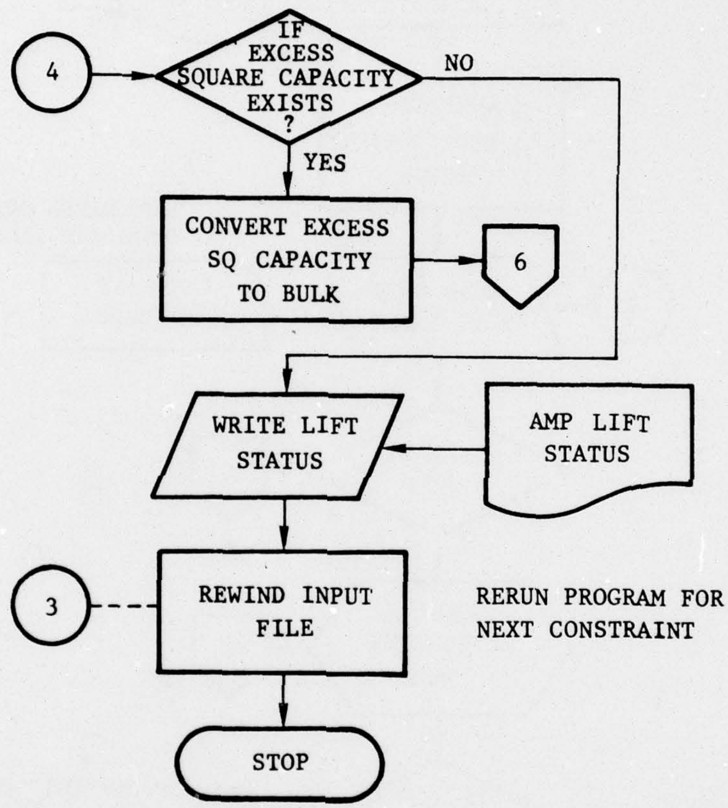


FIGURE E-1. PROGRAM AMPSF


1
WRITE AMP LIFT CAPACITY
AMP LIFT CAPACITY
COMPUTE BROKEN STORAGE FACTOR
REMAINING CODE EXECUTES ONCE FOR EACH UNIT
9
READ UNIT LIFT CARDS
UNIT AMP LIFT CARDS
IF LAST UNIT
YES
4
NO
CALL SUBROUTINE CONST
2
IS SHIP CAPACITY EXCEEDED ?
NO
9
AFTER SHIP CAPACITY IS EXCEEDED, THE LIFT SHORT FALL IS DETERMINED
YES
WRITE LAST UNIT LOADED
9


4
IF EXCESS SQUARE CAPACITY EXISTS ?
NO
YES
CONVERT EXCESS SQ CAPACITY TO BULK
6
WRITE LIFT STATUS
AMP LIFT STATUS
3
REWIND INPUT FILE
RERUN PROGRAM FOR NEXT CONSTRAINT
STOP

AD-A041 598 STANFORD RESEARCH INST MENLO PARK CALIF NAVAL WARFAR--ETC F/G 15/5
MATERIEL WEIGHT AND CUBE CONTROL (1975-1980).(U)
MAR 76 T H ALLEN, R B RINGO N00014-75-C-0708

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The program also reexecutes by rewinding the input data files after reallocating excess square cargo capacity to bulk while processing the same constraint. Control is passed to entry point 6 on the figure for this purpose.

The cargo factor deck is read into an array and placed in common, providing a look up table for each unit in the AE to Subroutine CONST. The Amphibious Ship Characteristic Deck is read by the program, permitting the bulk and square loading capacity totals to be obtained. These totals are modified on those runs where reallocation of square to bulk took place. The total square used becomes the square capacity, and the converted additional bulk space from the excess square is added to the previous total bulk. The lift capacity for each ship in the deck is written to output. The format for these cards and the data contained thereon are the input to the TFE Program. Only two of the many fields on this card are used by this program. The dual use of these cards, however, adds a greater dimension to the analytical effort. The broken stowage factor for bulk and square is then applied to the total lift capacity.

At this point the program reads the unit movement requirement deck and executes the next section of code, once for each unit. After processing each unit, control is passed to entry point 9 after completely processing each unit. Control is passed to entry point 4 after the last unit card is processed. When a unit card is read, Subroutine CONST is called passing control to the entry point on Figure E-2.

After each unit is loaded into the ships, a check is made to determine when the total ship capacity is exceeded. A message is written to output indicating which unit was the last to be loaded and the materiel of that unit not loaded, if any. If lift capacity is not exceeded for the unit being processed, control is passed to 9, and a new unit card is read for processing the next unit.

After the last unit is processed, control is passed to four, and a check is made to determine if excess square exists in ship capacity. When this occurs, a conversion of the excess square to bulk takes place, and control passes to 6, where the program will be rerun entirely for the same constraint value after adjusting the lift capacity for the converted excess square. An excess square condition can occur only once for the same constraint. On the second pass through the program for the converted square, the program bypasses the conversion routine, writes the lift status, and rewinds the input disk file. At this point, control passes to 3 since the end of the Do loop is encountered. The program is ready to execute again for the next constraint. When the last constraint run is completed, program control passes out of the Do loop and processing terminates.

B. Subroutine CONST

In Figure E-2, Subroutine CONST receives the bulk and square cargo requirements for the unit being processed from the parameter list. The cargo factor lookup table is provided by common storage arrays. An additional array is provided to CONST, permitting the recalculation of supply classes IIW and VIIW mountout from a modification factor for the combat active replacement factor (CARF) used in mountout calculations. This data is provided by a DATA Statement. When a modified CARF is desired, a flag is set, permitting a change in mountout for classes IIW and VII as each unit's data is processed.

The first operation is to find the unit passed to the subroutine in the cargo factor lookup table. When the unit is found, a code is obtained identifying the unit as a detachment or a complete unit. The cargo for the detachment is not constrained, so the program conducts the loading calculation and returns control to MAIN.

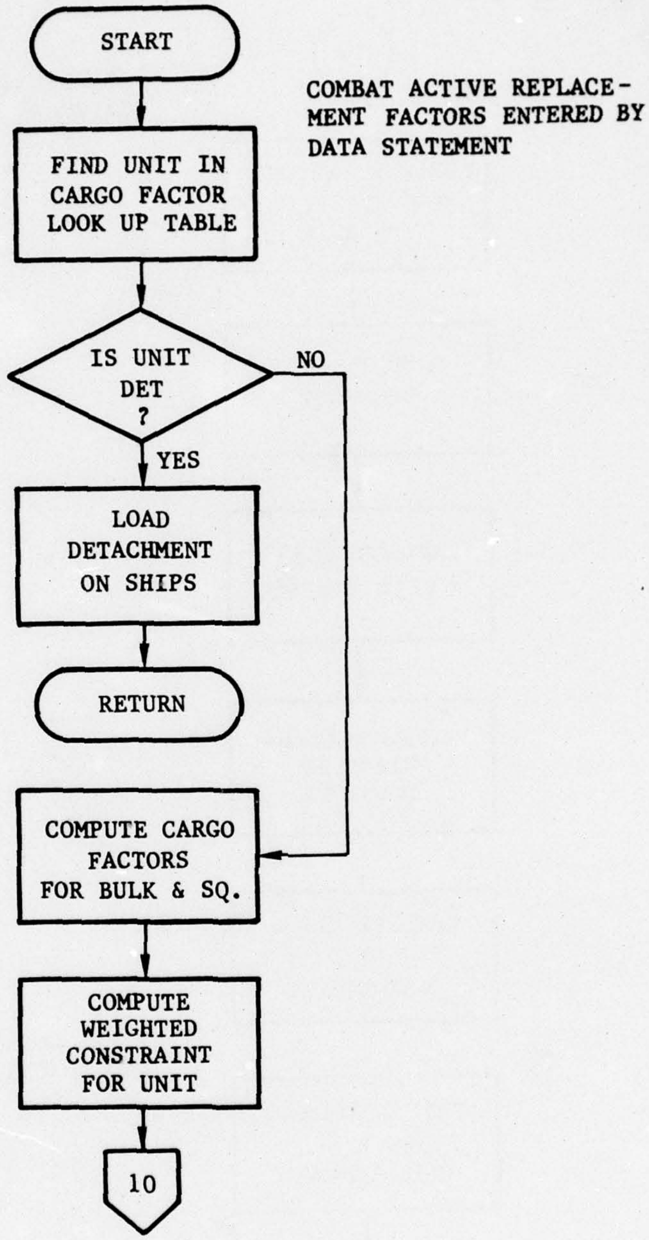
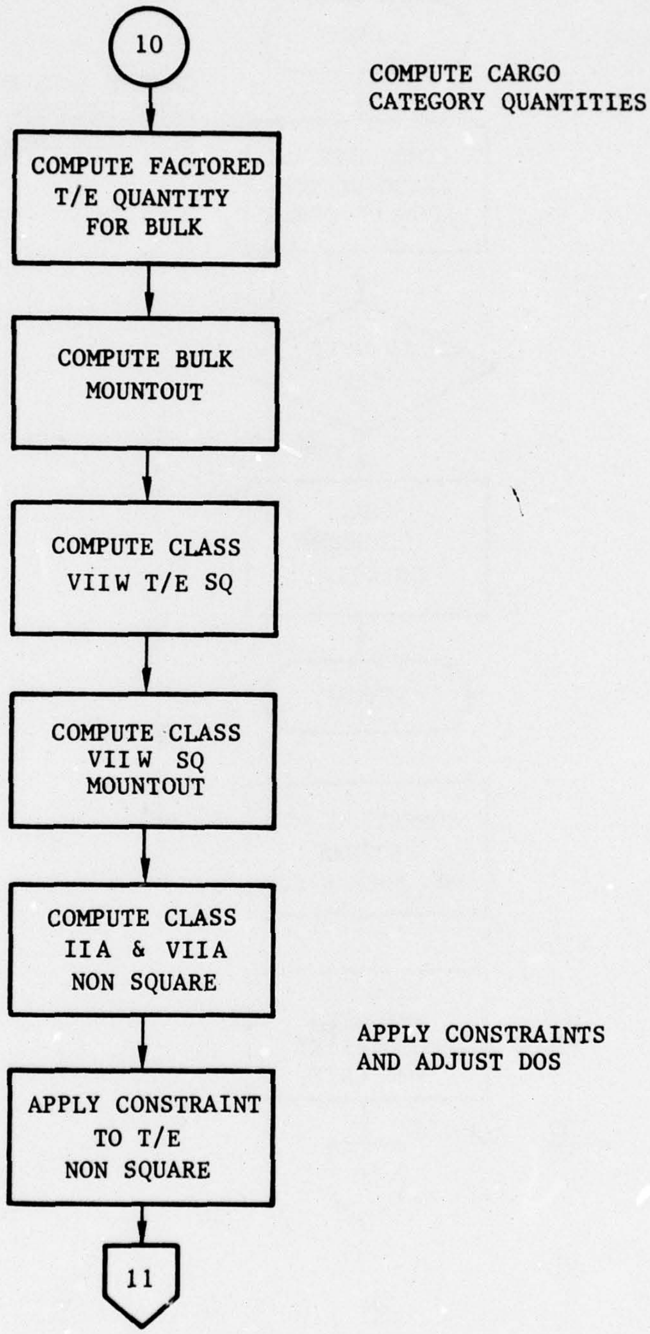
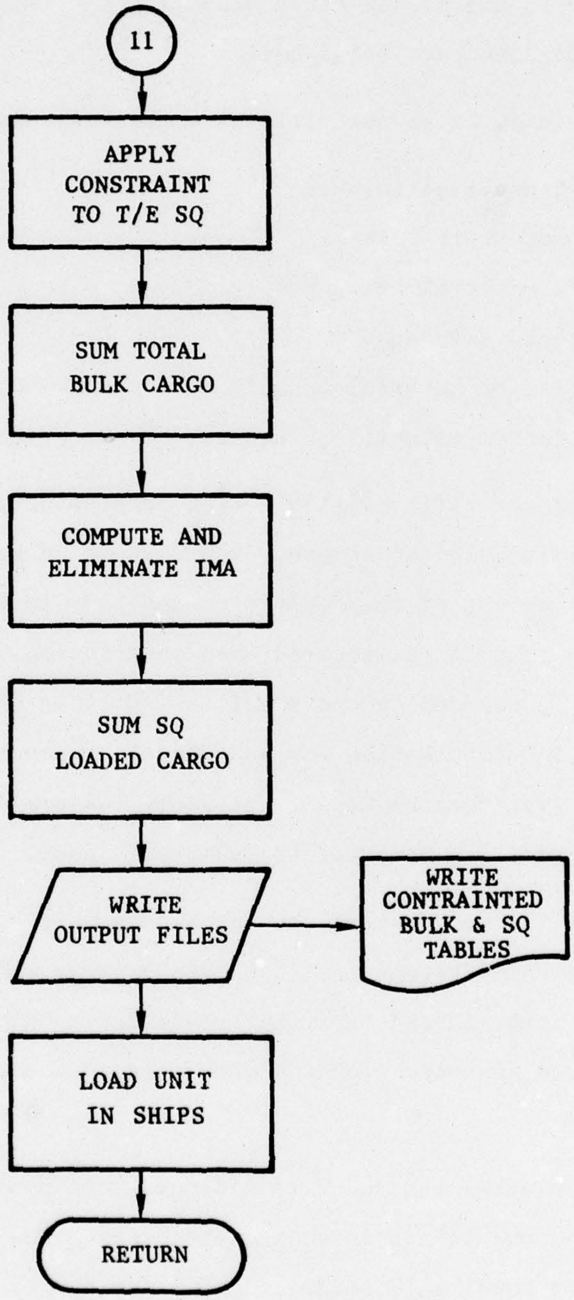


FIGURE E-2. SUBROUTINE CONST


10
COMPUTE CARGO CATEGORY QUANTITIES
COMPUTE FACTORED T/E QUANTITY FOR BULK
COMPUTE BULK MOUNTOUT
COMPUTE CLASS VIIW T/E SQ
COMPUTE CLASS VIIW SQ MOUNTOUT
COMPUTE CLASS IIA & VIIA NON SQUARE
APPLY CONSTRAINTS AND ADJUST DOS
APPLY CONSTRAINT TO T/E NON SQUARE
11


11
APPLY CONSTRAINT TO T/E SQ
SUM TOTAL BULK CARGO
COMPUTE AND ELIMINATE IMA
SUM SQ LOADED CARGO
WRITE OUTPUT FILES
WRITE CONTRAINTED BULK & SQ TABLES
LOAD UNIT IN SHIPS
RETURN

For complete units, the cargo factors are computed for bulk and square, T/E, and mountout. The constraint is then computed, based on a code found in the lookup table providing the assigned weight to the constraint for the particular unit.

The factored cargo quantities are then calculated for:

(1) T/E materiel in bulk

(2) Mountout in bulk

(3) T/E materiel in square

(4) Mountout in square

(5) Aviation materiel in bulk

(6) Aviation materiel in square.

With the factored cargo available, the constraint is then applied to T/E materiel in bulk and square. A provision is made in this routine to limit the amount of the constraint applied to T/E square loaded items. This feature is required when interfacing the square feet of the unit's T/E reduced to the specific TAM items eliminated by the Constrained T/E Embarkation Analysis Model of Appendix F. When processing a troop list through CALAS, the limit feature on applying constraints to square loaded T/E materiel is frequently used.

The DOS for mountout may be changed as well by entering a different value in the DATA Statement of the main program. This value is passed to the subroutine in the parameter statement. Unless a new value for DOS is entered, mountout remains unchanged in the processing within the subroutine.

Supply classes IIA and VIIA nonsquare are modified to factor IMA materiel from the totals in these categories. The amount to be included in the unit's total bulk cargo is OMA materiel. The IMA materiel is also eliminated from class VIIA square. It should be noted that MAGTF data includes IMA materiel with squadrons having the aircraft, thus

justifying this materiel for the H&M squadron. In actual practice, the H&M squadron would hold this IMA materiel, and therefore the removal of this materiel to the AFOE would be from H&M squadron materiel.

After all the adjustments to factored cargo are completed, the total bulk and square to be loaded for the unit is summed, and the loading operation is conducted. A table is written to output, listing each unit's input and adjusted cargo values used in the loading operation. This table is input via a manual operation to the Constrained T/E Embarkation Analysis Model. The subroutine then returns control to the main program.

Appendix F

CONSTRAINED T/E EMBARKATION MODEL

Part 1: Narrative Description

Appendix F

CONSTRAINED T/E EMBARKATION MODEL

Part 1: Narrative Description

I BACKGROUND

Each standard military unit in the Marine Corps has a prescribed Table of Equipment (T/E) detailing the equipment it is authorized to maintain. The ability of a unit to perform its function(s), is predicated on the availability of the major items of equipment listed in its T/E. Under conditions of commander's judgment, climate, intensive combat, etc., addenda are permitted. The discussion that appears in this appendix is limited to the standard T/Es of basic Marine Corps units.

During the planning stage prior to an amphibious operation, each basic unit brings its complement of equipment up to the authorized strength (if it is not so already) by requisitioning the items in short supply. However, if it is known during the planning phase that shipping space will be insufficient to carry the entire full strength T/E, some of the unit's equipment will have to be left behind in the assault echelon phase of the operation. Listings showing the equipment that can be carried by the assault echelon under space constraints should be prepared during the planning phase.

The standard T/E assumes that there will be no shortage of shipping space in which to load the authorized equipment; but if there is such a shortage, two problems arise: (1) can the operation be successfully mounted; and (2) what part of the full strength T/Es should be carried by each unit in the assault?

Thus, the problem addressed in this appendix is: given that shipping capability is limited by a fixed constraint (cube or square) for an amphibious operation, what is the optimum T/E that should be loaded? It follows that when there is a volume or square constraint on shipping, the objective is to minimize the loss in efficiency caused by the decrease in equipment and supplies.

II METHOD OF APPROACH

A. General Description

When the available shipping space for an entire MAF is inadequate for loading the T/O or T/E for that MAF, the first step in the solution of the problem is to allocate reduced shipping space among the various units that make up the MAF. The method by which the available shipping space is allocated is discussed in Section VI. For the purposes of the Constrained T/E Embarkation Analysis Model (CONTEAM), it is assumed that, for each military unit, a known amount of cube and square storage is given. The problem remaining is the optimal allocation of this scarce space.

For this model, only the class II and the class VII TAM items that appear in the unit's T/E are constrained. If this procedure is unpalatable, the constraint can theoretically be applied to any other class(es) of supply. This procedure produces a concrete, pared down T/E that is smaller than the standard published T/E for a unit. Thus, an operations officer can examine the curtailed T/E, see what would be missing from the assault echelon phase, and determine by how much the efficiency of the assault phase is decreased by the constraint.

To summarize, this appendix describes in detail the method of computing a pared down or constrained T/E for a given unit under square and cube constraints.

The output from the CONTEAM model shows for each unit's T/E the class II and class VII TAM items to be omitted from the assault echelon and to be carried by the follow-on echelon or later replenishment phase.

B. Rationales for Computing Constrained T/Es

Two different rationales were examined for computing constrained T/Es. The first rationale fills the available space with T/E items (TAMs) according to their importance to the unit--in other words, every unit of every TAM competes with every other unit of the same and other TAMs.

In the second rationale, the constrained space is further constrained by first filling part of its space with a "skeleton T/E" that consists of those items that will be absolutely essential during the interval between the landing of the assault echelon and the arrival of the follow-on echelon. The balance of the space is then filled according to the previous logic.

C. The Minimum Strength T/E that Can Support a Unit

Philosophically, it is interesting to debate the viability of a unit equipped below authorized strength. Actually this problem is one that is debated in real time by military planners--not by a research organization or a debating society. The output from the CONTEAM model simply shows the equipment to be taken, as well as the equipment to be left behind, for a unit with constrained loading space and leaves to the operational staff planning the operation the decision of whether or not the equipment allocated to this space is sufficient.

D. The Assignment Priority List

For the exercise of constructing a constrained T/E, one of the key devices is the assignment priority list. This list shows the value of each unit of each item (TAM) to operational readiness. If cube is the limiting factor, then clearly two items of the same volume, the same consumption rate, and the same criticality rank equally. As between two items

with identical criticalities and usage probabilities, but with different volumes, the item having the smaller volume is the more valuable since it puts a smaller strain on the constrained storage. It can even be shown if their volumes are sufficiently disparate, it may be advantageous to load several units of one item and no units of another, even though the items are identical in criticality and are equally likely to be utilized.

The logic upon which this seemingly paradoxical conclusion is based is the following. Usage rates are not determinative, but are stochastic. In other words, there is a finite probability that no units of either item will be utilized; and also a probability that more units of the plentiful item will be utilized than are loaded. Since a penalty will have to be paid if either item is short, we have the choice of chancing a shortage in one or both. <u>This finite chance always exists</u>. By deliberately increasing the odds of a shortage in one item, we are then able to stock enough units of the second item to reduce its odds of being short to a very low figure. Since we cannot avoid the finite probability of being short in both items, it can be advantageous to load no units of one of the items, even though that item has an expected usage rate of one per day.

Thus far the philosophy behind the construction of the priority assignment list has been described, but not the actual method of constructing the list itself.

E. <u>Construction of the Assignment Priority List</u>

The priority assignment list is a ranking showing the added benefit or advantage that accrues from having on hand each additional unit of each TAM item. Considering the penalties to operational readiness, the first unit of each TAM item is more important than the second unit of

the same TAM item; the latter is more important than the third unit of the same TAM item, etc. The reason for this is that there is a chance the first unit will be needed, while the second unit will either not be needed, or will be used for a less critical mission. Hence, the first unit protects more by itself than does the incremental protection purchased by the addition of the second unit, presuming the first unit is already on hand.

Again considering the penalties to operational readiness, the second, or even the third or fourth unit of one TAM item may be more important than the first unit of another item of the same criticality. The measure of importance or protection is the amount of operational readiness afforded per cubic foot or per square foot of storage space. It is at this point that the constraint of limited storage space makes its influence felt. What is being pursued is the maximum amount of protection or operational readiness per cubic foot or per square foot of storage space.

It must be emphasized that, if there is no limit on the resources to be loaded for the assault echelon, there is no problem to contemplate. Constraints on the T/Es, due to the lack of shipping availability, lie at the heart of the problem.

Previously, the value of a unit was defined as the <u>incremental protection afforded per cubic foot</u> or per square foot for that unit. The meaning of "per cubic foot" or "per square foot" should be clear; now the meaning of "incremental protection afforded" by that unit can be explained.

Attention is fixed on a particular TAM item. The incremental protection afforded by the first unit of that TAM item is simply the probability that that item will be needed for its highest function. For the second unit of the same TAM item the incremental protection afforded by this unit is the probability that exactly two units are needed, less

the probability that exactly one unit is needed. The incremental protection afforded by the third unit is the probability that exactly three units are required, less the probability exactly two units are required. And so on for the fourth, fifth, and subsequent units.

These individual probability terms depend, in turn, on the probability distribution for the TAM item in question. The distribution is determined essentially by historical experience.

For a large class of TAM items, the probability distribution is well represented by a Poisson distribution, the terms of which are easily calculated once an average demand is known.

For an item with mean demand (or expected need) exceeding 4, the demand distribution was assumed to be (truncated) normal, with mean a and variance a.

For each item, then, the incremental probability advantages are computed, multiplied by the item's criticality and divided by the item's cube (square). The sets of numbers so obtained are sorted, and the final priority assignment list might look as follows:

Item	Unit Number
1	1
1	2
2	1
3	1
1	3
2	2
1	4
3	2
4	1

This table shows, for example, that the first unit of item 3 is more valuable per cubic foot than the third unit of item 1, but less valuable than the second unit of item 1.

F. Disadvantages of the Above Algorithm

If TAMs are added to or removed from a T/E, the entire assignment priority list must be resorted. Even if a single T/E quantity for a TAM changes, a complete resort is necessary. A more serious difficulty comes from the fact that the incremental values must be computed for a very large number of units of each TAM; thus, the number of entries (TAM no.--Unit no.) to be sorted can be very large even for a T/E of modest size.

III AN ALTERNATIVE METHOD OF COMPUTING AN ASSIGNMENT PRIORITY LIST FOR A CONSTRAINED T/E

The main logic of the alternate method of constructing an assignment priority list for a constrained T/E is quite similar to the logic used in Volume II of the SRI/NWRC report, "Pre D-Day Fleet Marine Force Materiel Requirements Determination and Distribution System (1975-80)."[1] Detailed flowcharts appear in that reference.

First a spectrum of trial values of the parameter LAM (the Lagrangian parameter λ) is taken. The trial values of LAM should be in the neighborhood of the reciprocal of the largest T/E quantity. Since it is not at all burdensome to make simultaneous calculations for as many as twenty-five different values of LAM, one can assign several starting values of LAM on either side of the reciprocal of the largest T/E quantity.

Next, for each value of LAM, and for each TAM item, the optimal number of units to be included in the "constrained T/E" is computed according to the procedure described in the "Pre D-Day" study.

As the calculations proceed from one TAM to the next, cumulative totals for cube (square) are kept in a running fashion for each of the values of LAM. At the termination of this phase of the calculations--i.e., when all TAMs have been processed--there will be a set of up to twenty-five tentative constrained T/Es, one for each of the twenty-five starting values of LAM. In general, the number of units shown for each TAM will be a fraction. It is assumed in the preliminary calculations that each TAM is divisible. This device is a convenient fiction to make it possible, in the next step, to enable a more accurate interpolation for a new value of LAM which will allow us to more accurately obtain the target constraint.

It can happen that one of the starting values of LAM gives a constrained T/E that is close to the specified cube (or square). With a minor final adjustment, the computation is then finished.

If (on the other hand) none of the starting values of LAM gives a constrained T/E that is reasonably close to the preassigned square or cube, further computation is required. Ordinarily, this is easy. There will be two values of LAM that result in T/E's that bracket the desired constrained T/E. Several new values of LAM can then be chosen (between the two values last mentioned). The entire process just described can be repeated until a satisfactory constrained T/E is obtained.

IV EXPRESSING UNIT OPERATIONAL READINESS

By assigning a weight (or importance) to each item of equipment of a unit, a measure or index of operational readiness can be calculated that is oriented toward the unit's operational function(s).

In this study readiness is estimated by assigning a weighted value to each priority category of equipment. For this procedure designate:

c_h = criticality of a high-priority item = 8

c_m = criticality of a medium-priority item = 4

c_l = criticality of a low-priority item = 2

c_n = criticality of a non-priority item = 1

and

q_h = quantity of a high-priority item

q_m = quantity of a medium-priority item

q_l = quantity of a low-priority item

q_n = quantity of a non-priority item

Thus overall readiness, OR, can be expressed by

$$OR = \frac{q_h c_h + q_m c_m + q_l c_l + q_n c_n \text{ (for constrained T/E)}}{q_h c_h + q_m c_m + q_l c_l + q_n c_n \text{ (for authorized T/E)}}$$

or

$$OR = \frac{8q_h' + 4q_m' + 2q_l' + q_n'}{8q_h' + 4q_m' + 2q_l' + q_n'} .$$

The weights should be assigned by operational judgment. In this study the weights were assigned as 8,4,2,1 running from the highest - priority items according to importance to their unit's mission.

For a given T/E and unit, multiplying the quantity (density) of each item of equipment by its weight (criticality) and summing the products will give a value that indicates full or maximum readiness for that unit. If for some reason the T/E must be constrained by lack of shipping, availability of T/E items, etc, the quantities that can be shipped or that are available can be multiplied by their weighting factor and after summing the products the value of readiness obtained can be compared against that value of readiness obtained from a 100% filled T/E and expressed as a percentage.

For study purposes three readiness indexes were calculated for each unit: (1) An index for square loaded items, (2) an index for cube loaded or bulk items, and (3) an overall index for all items of a unit.

The overall OR index gives the capability for examining important trade-offs. As an example, take an M1038 Infantry Battalion. Suppose only 91% of the required square is available for square-loaded items, and 64% of the required cube is available for bulk loaded items. By using the Constrained T/E Embarkation Analysis Model, a preliminary constrained T/E is computed. The OR index for this constrained T/E turns out to be 85.05.

Now suppose for the same unit the square is further constrained to 85% of the square required to load the entire T/E for M1038 and let this reduction in square be reallocated to increase the loading capacity for the units bulk cargo. By the usage of the CCF model, it is shown that this trade-off (increasing the amount of square stowage that is left unloaded from 9% to 15%) increases available bulk cargo loading space from 64% to 75%.

To determine if this reallocation is beneficial, the Constrained T/E Embarkation Model is again employed and an Operational Readiness Index of 87.73% is computed.

Therefore it can be deduced that by reducing the square loaded from 91% to 85% and reallocating this space to bulk cargo, an increase in Operational Readiness from 85.05 to 87.73 results.

The logic of the Operational Readiness Index is impeccable if one is willing to admit that the shortages can be ranked in importance; e.g., a shortage of paper towels is not equivalent to a shortage of generators, even though both shortages do cause trouble. By assigning a weight or criticality to each item of a T/E, we can assign a measure of how painful a shortage of an item is to a unit. Each shortage of an item decreases the efficiency of a unit and it is precisely this loss of efficiency that the Operational Readiness Index measures.

V EXPRESSING CRITICALITY

There is no generally agreed upon measuring rod of criticality. Perhaps this is because criticality is difficult to measure. Criticality of a particular item varies with the combat or support situation. Evaluation of the importance of a given piece of equipment can even vary between two officers trained in the same field in assessing the relative criticality of various pieces of equipment, weapons, or repair parts.

It is necessary to point out the connection between "criticality" in the sense of "combat critical" and the other meanings of the term. These additional meanings include the following:

Procurement Lead Time

If a piece of equipment, say a turbine, a generator, or special purpose gasoline-powered motor, can be procured only with difficulty from one source (manufacturer), more attention must be paid to transporting, ordering, supplying, and deploying this item than in the contrary situation.

Distribution Time

Items that require a particularly long packing, processing, or distribution time are critical in another sense. Extremely fragile and medical supply items are examples of items that might require special handling.

Relative Dependence

There is a certain relativity of criticality between certain pairs of items. Film or blood plasma cannot be stored without a refrigerator. Ammunition is useless without a weapon. Sophisticated weapon systems may be ineffective without aircraft spotters. Thus it can be seen that the criticality of one item can be dependent on the availability or non-availability of a second item.

It is assumed that criticality is greater for the first few units of an item than for the last few units of a given item. Thus, if a T/E requires 58 radios, and all radios are planned to be in use, we still might assume that the military unit will be functional with only 29 radios, even though the next 29 would also serve an important function.

Note that the rationale just explained is only that. It is not intended to be a philosophical discussion of the true criticality of any one of the radios. All that is presented is a method of computation; a method that enables the production of a "constrained T/E." If the "constrained T/E" is not appealing to the planner, he is at liberty to change it according to his independent judgment. The computer program that utilizes this concept is to be thought of as only a first step in the planning process. If it does not produce a final result, at least it produces something of value as an intermediate result.

Lacking reports of a definitive criticality study, one can successfully assign criticalities if he bears the following in mind. First, successful management of many T/Es must be automated, at least in part. Second, automation is even more successful if criticality ratings can be assigned to items in a reasonable manner. Third, accuracy but not perfection in the assignment of criticality is required. Fourth, little success is achievable if every item is rated "highest criticality." Relative ratings must be given. Fifth, a system is more easily managed, and to that extent more efficient, if not too many items are given the highest criticality rating.

It must be remembered that all T/E items are "critical" in the lay sense of the word. An item is placed in a unit's T/E because it is valuable to that unit. The important function is to assign relative criticalities to each item within a T/E.

The Constrained T/E Embarkation Analysis Model is a useful tool in assisting the operational planning officer in assigning criticalities. By varying his criticalities for various items and studying the shortage lists, the planner will be able to adjust his assumptions to obtain results that improve upon his field experience. The user of the model will also learn that sensitivity of the model to variations in criticality ratings is greater for large items than for small ones.

If criticality has any meaning at all, it should be taken into account in the "constrained T/E" logic. To place insufficient emphasis on criticality is to decrease operational readiness.

VI ASSIGNING CRITICALITY

A. Introduction

The importance of an item of equipment to a unit's mission can be derived by relating its usage to specific functions of the unit and, in turn, determining the relative importance of the specific functions to the unit's combat mission.

For the purpose of this study each T/E item was assigned a priority that related to its importance to the unit's mission. Four categories or ranks of priorities were established:

- High-Priority
- Medium-Priority
- Low-Priority
- Non-Priority.

The scoring procedure for criticality was 8,4,2,1 from most critical to least critical. As between categories the scoring value is arbitrary, but for study purposes we assumed the items in the highest priority category are twice as badly needed as items in the second priority category and so on down the line. The relative pain of shortages is, therefore, 8,4,2,1. These figures can easily be changed without jeopardizing the rationale of our calculations. For example, certain weapons or super critical items can be given artifically high priorities so that the program always prefers them to other items.

B. Item Usage Designation (Designation of Application of a Given TAM)

Before a criticality can be assigned a piece of equipment for a unit, it is necessary to relate each principal item (TAM) to a function, and in some cases more than one function, performed by FMF units. The twenty-two discrete functions that a unit may perform are listed below and described later in this appendix.

1. Infantry Combat Small Arms Employment
2. Fire Support
3. Fire Support Control
4. Mobility
5. Communications
6. Intelligence
7. Surface Transportation
8. Engineer Construction
9. Demolition/Obstacle Clearance
10. Supply
11. Maintenance
12. Cargo Handling
13. Service Support
14. Medical
15. Air Support Control
16. Power Generation
17. Ordnance Delivery
18. Air Control
19. Air Operations Support
20. Air Transport
21. Communications/Electronics Maintenance
22. Aviation Maintenance

Examples of this functional assignments are:

TAM	DESCRIPTION	FUNCTIONAL GROUP
A0240	CENTRAL OFFICE TELEPHONE	COMMUNICATIONS
A0380	COUNTERMEASURES SET	INTELLIGENCE
B0780	GENERATOR SET	POWER GENERATION
D0900	TRUCK, AMBULANCE	MEDICAL

For a complete catalog breakdown of all TAM items in the table of essential equipment (TEE) the reader may refer to Table F-1.

It should be noted that the criticality of the same TAM can vary depending on the military unit for which it is listed in the various T/Es. For example, if a unit has "communications" as one of its primary functions, and the TAM item is a radio or a telephone switchboard, the TAM is high-priority (8) for that unit. However, should another unit have "communications" as a secondary function, the radio or telephone switchboard would be assigned as a medium-priority (4) item.

Table F-1

EQUIPMENT FUNCTIONS

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A0005	ACCESSORY KIT, RADIO SET, MK- 706/PRC-41					1																	
A0007	ADAPTER, POWER SUPPLY,U-383/VR					1																	
A0010	AIRBORNE/MOBILE DASC, AN/UYQ-3															1							
A0020	AIR CONDITIONER, HD-294/U													1									
A0023	AIR CONTROL CENTRAL AN/TYQ-1																		1				
A0040	ANALYZER,SPECTRUM,AN/UPM-84B																					1	
A0050	ANTENNA, AS-2236/GRC					1																	
A0052	ANTENNA,DIRECTIONAL,HIGH					1																	
A0053	ANTENNA GROUP AN/GRA 94					1																	
A0055	ANTENNA,VHF LP,MANPACK					1																	
A0060	ASRT COMM/PLANNING FACILITY, AN/TPA-9																	1					
A0075	BATTALION TERMINAL, DATA TRANS					1																	
A0090	BATTERY CHARGER PP-6241/U					1																1	
A0120	BRIDGE IMPEDANCE, ZM-46/U																					1	
A0122	BRIDGE, RADIO FREQUENCY																					1	
A0130	CABLE ASSEMBLY SET, AN/PRA-4																					1	
A0140	CABLE LASHING MACHINE, LC-231/FT					1																	
A0150	CABLE LAYER, UNDERGROUND, LC-61					1																	
A0160	CABLE SPLICER KIT, TE-56					1																	
A0175	CALIBRATION COMPLEX, TRANS- PORTABLE AN/TSM																					1	
A0210	CALIBRATOR SET, RANGE, AN/ UPM-11																					1	
A0220	CALIBRATOR SET, RADIAC, AN/UDM-1A																					1	
A0240	CENTRAL OFFICE TELEPHONE, AN/MTC-1					1																	
A0245	CENTRAL OFFICE TELEPHONE, AUTOMATIC AN/TT					1																	
A0246	CENTRAL OFFICE, TELEPHONE					1																	
A0250	CENTRAL OFFICE, TELEPHONE MANUAL, AN/TTC-					1																	
A0261	CLEANER, ULTRASONIC																					1	
A0268	COMMUNICATIONS CENTRAL, AN/TGC-37					1																	
A0270	COMMUNICATIONS CENTRAL, AN/TSC-15					1																	
A0280	COMMUNICATIONS CENTRAL, UHF, AN/TYA-11					1																	
A0281						1																	
A0282						1																	
A0290	COMMUNICATIONS CENTRAL, UHF, AN/MRC-35A-MTD					1																	
A0296	COMPUTER, GENERAL PURPOSE													1									
A0298	COMPUTER INDICATOR GROUP AN/TPA-5A																	1					
A0300	COMPUTER INDICATOR GROUP, OA-3855/TPS-34																	1					
A0310	CONSOLE COMMUNICATION CONTROL,AN/TSA-16					1																	
A0311	CONTROL CENTRAL, TECHNICAL AN/					1																	
A0312	CONTROL, COMMUNICATION CENTRALGROUP C-8C19/TY					1																	
A0315	CONTROL POWER SUPPLY, C7674/					1																	
A0320	CONTROL RADIO SET, AN/GRA-6					2																	
A0328	CONVERTER FREQUENCY CV-2455 F/AN/PRC-47					1																	
A0340	CONVERTER, TELEGRAPH-TELEPHONESIGNAL, TA-182/					1																	
A0345	CONVERTER, TELEPHONE SIGNAL					1																	
A0360	COUNTERMEASURES ELECTRONIC SIMULATOR DEVIC						1																
A0380	COUNTERMEASURES SET, AN/MLQ-25MOUNTED IN 1/4						1																
A0390	COUNTERMEASURES SET AN/TLQ-14						1																
A0400	COUNTERMEASURES SET AN/TLQ-17						1																
A0410	COUNTERMEASURES SET, AN/TLQ-19						1																
A0435	CRYSTAL KIT, CK-32/PR					1																	
A0436	CRYSTAL KIT, CK-35/PR					1																	
A0437	DATA COMMUNICATIONS TERMINAL AN/TYC-5 -V-																		1				
A0439	DATA TERMINAL CV 1829/G																		1				
A0440	DECODER GROUP, AN/GPA-60																		1				
A0450	DECODER GROUP, AN/GPA-60A																		1				
A0460	DECODER GROUP, AN/UPA-52																		1				
A0465	DECODER GROUP, AN/UPA-60																		1				
A0490	DETECTING SET, SEISMIC INTRUSION, AN/P	1					1																

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A0493	DETECTOR, SMALL LIGHTWEIGHT						1																
A0496	DIGITAL MESSAGE ENTRY DEVICE						1																
A0498	DIGITAL MESSAGE UNIT (DMU)						1																
A0499	DIPLEXER, VHF					1																	
A0500	DIRECTION FINDER SET, AN/GRD- 11A																						
A0510																							
A0515	DIRECTION FINDER SET AN/MRD-18						1																
A0520	DIRECTION FINDER SET, AN/TRD- 12						1																
A0540	DIRECTION FINDING PLOT FACILITY, AN/TS						1																
A0545	DISTANCE MEASURING, EQUIPMENT,MRA-301						1																
A0550	DISTANCE MEASURING SET, AN/TRO-19						1																
A0553	DIVISION TERMINAL, DATA TRANS-					1																	
A0610	ELECTRONIC EQUIPMENT MODIFI- CATION KIT, MK-																						
A0625	ELECTRONIC MONITOR AND CONTROLFACILITY AN/TSQ						1																
A0630	ELECTRONICS INTERCEPT/CONTROL FACILITY, AN/TS						1																
A0640	ELECTRONICS SUPPORT GROUP AN/TSA-36					2																	
A0655	FIXTURE, BINOCULAR, COLLIMAT- ING, W/E											1											
A0659	FACSIMILE SET AN/GXC-7					1																	
A0660	FREQUENCY MEASURING SET, CP- 843/U, W/PLUG I																						
A0670	FREQUENCY METER, AN/URM-32																						
A0675	FRENQUENCY METER, AN/USM-159																						
A0680	GENERATOR PULSE, AN/UPM-15																						
A0685	GENERATOR, PULSE AN/UPM-																						
A0690	GENERATOR PULSE, SG-588/U																						
A0710	GENERATOR SIGNAL, AN/URM-25B																						
A0730	GENERATOR SIGNAL, AN/URM-48																						
A0740	GENERATOR SIGNAL, AN/URM-61A																						
A0750	GENERATOR SIGNAL, AN/URM-64A																						
A0770	GENERATOR SIGNAL, SG-616/U																						
A0775	GENERATOR SIGNAL, SG-701/U																						
A0780	GENERATOR SIGNAL, TS-155C/UP																						
A0790	GENERATOR SIGNAL, TS-452C/U																						
A0800	GENERATOR SIGNAL, AN/USM-44A																						
A0805	GENERATOR SIGNAL, AN/USM-323																						
A0810	RADIO TRAINING EQUIPMENT, AN/URA-T2					2																	
A0815	HELIPORT LIGHTING SET,																						
A0823	IMAGERY INTERPRETATION						1																
A0848	INTELLIGENCE ANALYSIS/STORAGE						1																
A0850	INTERCEPT CONTROL FACILITY, AN/TSQ-53						1																
A0860	INTERCEPT FACILITY HEAVY AN/TSQ-54A						1																
A0865	LIGHT INTERCEPT FACILITY AN/						1																
A0870	INTERCOMMUNICATION SET, AN/GIC-1					2																	
A0880	INTERROGATOR SET, AN/TPX-28 -L 24 W 13-3/8																						
A0893	LINE UNIT, TELEPHONE TA-807/GCC					1																	
A0911	MAINTENANCE KIT, ELECTRONIC																						
A0912	MAINTENANCE KIT, ELECTRONIC EQUIPMENT, MK-9																						
A0921	MEASURING SET, NOISE, TTS-37B																						
A0922	METASCOPE, ASSEMBLY, IMAGE, INFRA-RED, M990	1					1																
A0985	MODULATION METER ME-57																						
A0990	MOTOR, 400 CPS, PD-83/U					Z																	
A1065	MULTIMETER, DIGITAL																						
A1082	MULTIMETER AN/USM-337																						
A1083	NIGHT VISION SIGHT, INDIVIDUALSERVED WEAPON,	1																					
A1085	NIGHT VISION SIGHT, INDIVIDUAL						1																
A1086	NIGHT VISION SIGHT, CREW SERVED WEAPON,	1																					
A1087	NIGHT VISION SIGHT, TRIPOD MOUNTED, AN/TVS						1																
A1088	NIGHT VISION SIGHT, CREW SERVED	1																					
A1100	OPERATIONS CENTRAL, AN/TSQ-5																						
A1110	OPERATIONS CENTRAL, AN/TSQ-6																						
A1135	OSCILLATOR TRANSFER CV-																						
A1180	OSCILLOSCOPE, AN/USM-117																						
A1190	OSCILLOSCOPE, AN/USM-140B																						
A1220	PANORAMIC INDICATOR, IP-173 C/U																						

Table F-1 (continued)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A1225	POWER MEASURING SET, AN/USM-																					1	
A1227	POWER MEASURING SET AN/USM-( )																					1	
A1240	POWER SUPPLY, PP-388/U																1					1	
A1255	POWER SUPPLY PP-( )																1					1	
A1290	PUBLIC ADDRESS SET, AN/TIP-1					1																	
A1300	PUBLIC ADDRESS SET, AN/TIQ-2					1																	
A1350	RADAR, COURSE DIRECTING, CENTRAL, AN/TPQ															1							
A1360	RADAR COURSE DIRECTING CENTRAL															1							
A1370	RADAR DATA RELAY SET, AN/TXQ-1																			1	1		
A1380	RADAR RELAY SET AN/TXQ-3																			1	1		
A1395	RADAR SET AN/MPQ-4A						1																
A1400	RADAR SET, AN/MPQ-10A						1																
A1415	RADAR SET, AN/PPS-15						1																
A1420	RADAR SET AN/PPS-6						1																
A1435	RADAR SET, AN/TPQ-31						1																
A1450	RADAR SET, AN/TPS-21																	1					
A1460	RADAR SET, AN/TPS-22A																		1				
A1470	RADAR SET AN/TPS-32																	1	1				
A1480	RADAR SET, AN/TPS-34																	1	1				
A1490	RADAR SET, AN/TPS-37, TRUCK- TRLR MTD																	1	1				
A1500	RADAR SET AN/TPS-63																	1	1				
A1503	RADAR SET, LIGHTWEIGHT 3D,																		1				
A1505	RADAR SET, AN/UPS-1B															1		1	1	1			
A1507	RADAR SET, AN/UPS-1D															1		1	1	1			
A1508	RADAR SET, AN/UPS-1C															1		1	1	1			
A1510	RADAR SIGNAL SWITCHBOARD, AN/TPA-4																		1				
A1520	RADAR SIG SIMULATOR, AN/UPM- 124																					1	
A1525	RADAR TEST SET, AN/TPM-16																					1	
A1530	RADAR TEST SET AN/ UPM-98																					1	
A1540	RADAR TEST SET, AN/UPM-99																					1	
A1550	RADAR TRAINER, AN/SPS-T2A																		1				
A1560	MOBILE RADIAC CALIBRATION FACILITY																					1	
A1630	RADIAC SET, AN/PDR-54						1																
A1640	RADIO CONTROL FACILITY, AN/TSQ-40A						1																
A1660	RADIO DIRECTION FINDING SYSTEM, AN/TRD-						1																
A1670	RADIO FACILITY GROUP, AN/TSQ-41A						1																
A1680	RADIO FACILITY GROUP, AN/TSQ- 42, AN/TSQ-42A						1																
A1690	RADIO INTERCEPT FACILITY, AN/TSQ-54						1																
A1700	RADIO INTERFERENCE MEASURING SET, AN/PRM-1A																					1	
A1710	RADIO INTERFERENCE MEASURING SET, AN/URM-47A																					1	
A1715	RADIO RECEIVER AN/PRR-15					1																	
A1718	RADIO RECEIVING SET, AN/TRQ-30					1																	
A1730	RADIO SET, CONTROL GROUP, AN/GRA-39A					2																	
A1780	RADIO SET, AN/GRC-46					1																	
A1790	RADIO SET, AN/GRC-109					1																	
A1800	RADIO SET, AN/GRC-125					1																	
A1810	RADIO SET, AN/GRC-135A					1																	
A1815	RADIO SET AN/GRC-160					1																	
A1860	RADIO SET, AN/MRC-40, MTD IN TRLR 1-1/2 T 2W					1																	
A1870	RADIO SET, AN/MRC-47, MTD IN 2 TRKS 2-1/2T 6					1																	
A1880	RADIO SET, AN/MRC-60					1																	
A1890	RADIO SET, AN/MRC-63, MTD IN TRK - TRLR 3/4					1																	
A1900	RADIO SET, AN/MRC-123					1																	
A1910	RADIO SET, AN/MRC-124					1																	
A1920	RADIO SET, AN/MRC-109, MOUNTED IN TRUC					1																	
A1930	RADIO SET, AN/MRC-110, MOUNTED IN TRUC					1																	
A1960	RADIO SET, AN/PRC-6					1																	
A2000	RADIO SET, AN/PRC-25																						
A2010	RADIO SET, AN/PRC-41					1																	
A2020	RADIO SET, AN/PRC-47					1																	
A2030	RADIO SET AN/PRC-68					1																	
A2040	RADIO SET AN/PRC-75					1																	
A2050	RADIO SET, AN/PRC-77					1																	

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A2060	RADIO SET, AN/PRC-93					1																	
A2070	RADIO SET, AN/TRC-27					1																	
A2080	RADIO SET, AN/TRC-75					1																	
A2090	RADIO SET, AN/TRC-97, 12 CHANNEL, -DIMEN					1																	
A2091	RADIO SET, AN/TRC-97E, 24 CHANNEL -DIMENS					1																	
A2130	RADIO SET, AN/VRC-12					1																	
A2150	RADIO SET, AN/VRC-47 ALL CONFIGURATI					1																	
A2180	RADIO TERMINAL SET, AN/MRC-62,2MTD IN TEK-TRL					1																	
A2182	RADIO TERMINAL SET, AN/MRC-134					1																	
A2183	RADIO TERMINAL SET, AN/MRC-135					1																	
A2184	RADIO TERMINAL SET, AN/TRC-166					1																	
A2185	RADIO WIRE INTEGRATION CONTROL					1																	
A2217	RECEIVER R-1414/URR					1																	
A2220	RECEIVER RADIO, R-390/URR					1																	
A2225	RECEIVER SET, AN/PRR-9					1																	
A2230	RECEIVING SET, RADIO AN/GRR-5					1																	
A2240	RECEIVING SET RADIO AN/GRR-17 - INTERIM-MODEL					1																	
A2250	RECEIVING SET, RADIO AN/URR-23					1																	
A2260	RECORDER REPRODUCER, AN / PNH-4					1																	
A2270	RECORDER REPRO SET, SOUND, AN/UNH-3					1	1																
A2280	RECORDER REPRO SET, SOUND, 300-C					1	1																
A2290	REELING MACHINE CABLE, ENGINE DRIVEN, RL-118/					1																	
A2295	REGIMENTAL TERMINAL, DATA TRAN					1																	
A2310	SHELTER, ELECTRICAL EQUIPMENT,S-126A/G -L 147					1																	
A2320	SHELTER, ELECTRONICS MAINTE- NANCE SUPPORT,																						
A2340	SHOP, ELECTRONIC, AN/GRM-32 -L 146 X W 83 X																						
A2350	SHOP, ELECTRONIC, AN/GRM-38 -L 146 X W 83 X																						
A2355	SHOP ELECTRONIC AN/GRM-																						
A2360	SHOP, ELECTRONIC, AN/GRM-32 -L 147 X W 87 X																						
A2362	SHOP, ELECTRONIC MAINTENANCE AN/GRM-98																						
A2363	SHOP ELECTRONICS MAINTENANCE,																						
A2365	SHOP, TEST EQUIPMENT																						
A2370	SIGNAL ANALYSIS FACILITY, AN/TSQ-64						1																
A2380	SIGNAL ASSEMBLY SWITCHBOARD, TA/207/P					1																	
A2385	SIGNAL INTELLIGENCE/ELECTRONIC						1																
A2390	SIGNAL LAMP EQUIPMENT SE-11/ SE-11A					1																	
A2392	SIGNAL MONITOR FACILITY,LIGHT AN/TSQ-88 -V-						1																
A2394	SIGNAL MONITOR FACILITY, HEAVY AN/TSQ-89						1																
A2400	SIMULATOR ANTENNA POSITIONER SM-366/GRD																						
A2410	SIMULATOR COUNTERMEASURES SIGNAL, SM-316/																						
A2432	SOUNDING SET, SONAR AN/SQN-16						1																
A2440	SPECIAL COMM CENTRAL, AN/MSC- 43					1																	
A2441	SPECIAL COMMUNICATIONS CENTRAL					1																	
A2472	SUPERVISORY OPERATIONS GROUP					1																	
A2480	SWITCHBOARD, TELEPHONE, MANUAL, SB-22/P					1																	
A2490	SWITCHBOARD, TELEPHONE, MANUAL, SB-86/P					1																	
A2500	SWITCHBOARD, TELEPHONE,MANUAL SB-3082/GT					1																	
A2505	SWITCHBOARD, TELEPHONE, MANUAL					1																	
A2510	TABLE, ELECTRICAL TEST AND MAINTENANCE																						
A2520																							
A2530	TACTICAL AIR OPERATION CEN- TRAL, AN/TYC-2																						
A2540	TACTICAL DATA COMMUNICATIONS CENTRAL AN/TYQ-																						
A2580	TELEGRAPH TERMINAL GROUP, AN/TCC-14					1																	
A2620	TELEPHONE EXCHANGE TRANS- PORTABLE AN/TTC					1																	
A2630	TELEPHONE SET, TA-341/TT					1																	
A2635	TELEPHONE SET, TA-838- -/TT					1																	
A2655	TELETYPE EQUIPMENT REPAIR																						
A2660	TELETYPEWRITER SET, AN/GGC-3					1																	
A2667	TELETYPEWRITER SET, AN/TGC-					1																	
A2670	TELETYPEWRITER SET, AN/TGC- 14A-V-					1																	
A2680	TELETYPEWRITER SET, AN/TGC-29-V-					1																	
A2685	TERMINAL, TELEGRAPH-TELEPHONE TH-55/GCC					1																	
A2687	TEST EQUIPMENT GROUP, THIRD																						

Table F-1 (continued)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A2680	TEST EQUIPMENT GROUP, FIFTH																					1	
A2690	TEST HARNESS, RADIO SET, AN/ARM-38																					1	
A2700	TEST KIT, MK-992/VRC-12																					1	
A2710	TEST KIT, MK-993/PRC-25																					1	
A2720	TEST SET AN/GRM-56A																					1	
A2730	TEST SET, AN/UPM-84																					1	
A2750	TEST SET, COMMUNICATIONS CENTRAL, AN/TGM																					1	
A2760	TEST SET, COUPLER CONTROL, TS-1324/TRC-75																					1	
A2780	TEST SET, ELECTRICAL POWER, AN/USM-86A																					1	
A2830	TEST SET, RADAR, AN/TPM-20																					1	
A2840	TEST SET, RADAR, AN/UPM-6B																					1	
A2850	TEST SET, RADAR, AN/UPM-9C																					1	
A2870	TEST SET, RADAR, AN/UPM-32																					1	
A2880	TEST SET, RADAR, AN/UPM-55A																					1	
A2900	TEST SET, RADAR, TS-147B/UP																					1	
A2910	TEST SET, RADAR, TS-1740/TPS																					1	
A2920	TEST SET, RADIO, AN/GRM-21																					1	
A2930	TEST SET, RADIO, AN/GRM-46																					1	
A2950	TEST SET, RADIO AN/TRM-17																					1	
A2990	TEST SET, RADIO, AN/URM-124																					1	
A3000	TEST SET, RADIO FREQUENCY POWER, AN/USM-6																					1	
A3010	TEST SET, RADIO, TS-1310/TRC- 27																					1	
A3020	TEST SET, RADIO, TS-1325/TRC- 75																					1	
A3060	TEST SET, TELETYPEWRITER, AN/UGM-5																					1	
A3062	TEST SET TELETYPEWRITER,AN/GGM																					1	
A3065	TEST SET, TRANSMISSION, TTS-4 ANH																					1	
A3070	TEST SET, TRANSISTOR, TS-1294 A/U																					1	
A3080	TEST SET, TS-1766/TSC-15																					1	
A3180	TRAILER BOLSTER, K-36 -L 11 X W 7 X H					1																	
A3190	TRAILER CABLE, ROD AND POLE, K-37 -L 12FT 5I					1																	
A3200	TRAILER MAINTENANCE CABLE SPLICER, K-38					1																	
A3212	TRAINING DEVICE 15A19A-MTDS																		2				
A3215	TRANSFORMER, WYE TO DELTA FOR USE W/PU-669/G																1						
A3230	TRANSLATOR TRANSCRIBER FACILITY, AN/TS						1																
A3235	TRANSMITTER SET, AN/PRT-4					1																	
A3236	TRANSPONDER SET, SOLID STATE						1																
A3237	TRANSPONDER SET, FORWARD AIR CONTROLLER, AN/						1																
A3238	TRANSPONDER SET, AN/UPN-32						1																
A3245	VIEWING SET, INFRA-RED AN/SAR-7						1																
A3275	WEAPONSIGHT, INFRA-RED, MODEL P155 -F/4TH MEF	1																					
A3310	WIRE REPAIR-REWIND SET, AN/TSM-5A																					1	
A7000																			1				
A7005	DISTRIBUTION BOX J-2573/TYA-2																		1				
A7010																			1				
A7015	ANTENNA AS1310/TYQ-3																		1				
A7020	CENTRAL COMPUTER GROUP AN/TYA-5																		1				
A7025	DATA PROCESSOR GROUP AN/TYA-6																		1				
A7030	GEOGRAPHIC DISPLAY GEN GROUP AN/TYA-7																		1				
A7035	OPERATOR GROUP AN/TYA-9																		1				
A7040	COMMUNICATIONS GROUP AN/TYA-12																		1				
A7045																			1				
A7050	DATA TERMINAL GROUP AN/TYA-17																		1				
A7055	3D RADAR DATA PROCESSOR GROUP AN/TYA-18																		1				
A7060	DATA COMMUNICATION GROUP AN/TYA-19																		1				
A7065	COMPATIBILITY COMPUTER GROUP AN/TYA-20																		1				
A7070																			1				
A7075																			1				
A7080																			1				
A7085																			1				
A7090																			1				
A7095	SIGNAL DATA CONVERTER CV-1927/TYA																		1				
00001	AIR CONDITIONER, MCS, HORIZON-													1									
00002	AIR CONDITIONER, MARINE CORPS													1									

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
B0003	AIR CONDITIONER, MARINE CORPS														1									
B0004	AIR CONDITIONER, MARINE CORPS														1									
B0005	AIR CONDITIONER, MARINE CORPS														1									
B0006	AIR CONDITIONER, MARINE CORPS														1									
B0007	AIR CONDITIONER, MARINE CORPS														1									
B0008	AIR CONDITIONER, MARINE CORPS														1									
B0009	AIR CONDITIONER, MARINE CORPS														1									
B0020	ANGLEDOZER, EARTH MOVING	F/USE W/TD-15 T								1														
B0035	BACKHOE, 1 CUBIC YD									1														
B0040	BACKHOE CRANE-SHOVEL, BAY	CITY, MOD 37								1														
B0060	BATH UNIT, TRLR MTD	MOD F-C-8B-61													1									
B0110	BOAT, BRIDGE ERECTION, HP-1270									1														
B0130	BRIDGE, FIXED-FLOATING, 60 TON									1														
B0140	BRIDGE, FIXED HIGHWAY TYPE,	60 TON								1														
B0150	BRIDGE, FLOATING, FOOT									1														
B0170	BUCKET, CONCRETE, HORIZONTAL	DISCHARGE, 3/4								1														
B0173	BUCKET, CLAMSHELL, 1 CUBIC YD									1														
B0175	BUCKET, CONCRETE, HORIZONTAL	DISCHARGE, 3/4								1														
B0185	BUCKET, DRAGLINE, 1 CUBIC YD									1														
B0203	BUCKET, DRAGLINE, PERFORATED									1														
B0208	F.T. MODEL 82-30M TEREX	DOUBLE DRUM, F/								1														
B0215	BUCKET, MULTI-PURPOSE, 2 1/4	YD CAP, DROTT 4								1														
B0270	CAMERA SET, STILL PICTURE							1																
B0280	CAMERA SET, STILL PICTURE							1																
B0325	CAMERA SYSTEM, PHOTO ID							1																
B0340	CHAMBER, FUMIGATING														1									
B0345																								
B0350																								
B0360	COMPRESSOR, RECIPROCATING	POWER DRIVEN, 4						1					1											
B0380	COMPRESSOR, RECIPROCATING	315 W/LB								1														
B0390	COMPRESSOR, AIR, ROTARY, 250	CFM, TRAILER-MO								1			1											
B0392	COMPRESSOR, AIR, ROTARY, 250	CFM, TRUCK MOUN								1														
B0394	COMPRESSOR 250 CFM, SKID MTD									1														
B0395	COMPRESSOR, 600 CFM, TRAILER	MTD								1														
B0399	CRANE, CRAWLER, 25T,W/40 FT									1														
B0400	CRANE-SHOVEL, CRAWLER MTD,	BAY CITY, MOD 3								1														
B0410	CRANE-SHOVEL, CRAWLER MTD,	KOEHRING, MOD 2								1														
B0435	CRANE, TRUCK MTD, DEC BC	150T46								1			1	1										
B0440	CRANE, WHEEL MTD, 3 TON, M-63									1			1	1										
B0455	CRUSHING AND SCREENING PLANT,	75TPH								1														
B0460	DARKROOM, PHOTO, TRLR MTD							1																
B0465	DECONTAMINATING APPARATUS,	POWER DRIVEN, S											1											
B0473	DETECTING SET, MINE, PORTABLE,	METALLIC AND NO									1													
B0475	DETECTING SET, MINE, PORTABLE,	METALLIC, P-153									1													
B0480	DISTRIBUTOR, BITUMINOUS, MOD	MX-RL, M45 TRK,								1														
B0520	DRAWBAR, ATTACHMENT, FIXED	TYPE, REAR MOUN								1														
B0550	DRILL, PNEUMATIC, DRIFTER,	CRAWLER MTD SEL								1														
B0560	DRILLING MACHINE, PERCUSSION,	STAR 71-P								1														
B0562	DRILLING MACHINE ROTARY, TRAIL									1														
B0577	DUMMY LOAD, GENERATOR SET,	60KW											1											
B0579	DUMMY LOAD, GENERATOR SET, 100												1											
B0590	FAIRLEAD ROLLER AND SHEAVE, 2N												1											
B0600	FAIRLEAD SHEAVE, BAY CITY, MOD37									1														
B0610	FAIRLEAD SHEAVE, F/BC, MOD	150-T46								1			1	1										
B0630	FLOODLIGHT, TRAILER, 4-WHEEL,	5KW, M-2 -QM-6-													1									
B0640	FORKLIFT ATTACHMENT, 6000 LB	CAPACITY, F/LOA												1										
B0645	FORKLIFT ATTACHMENT, 7000 LB	CAP+-F/TAM 8246												1										
B0671	FREQUENCY CONVERTER, MOTOR																	1						
B0672	FREQUENCY CONVERTOR, MOTOR	DRIVEN, 100KW,																1						
B0673	FREQUENCY CONVERTOR, SOLID STATE																	1						
B0675	FUEL DISPENSING SYSTEM,	TACTICAL AIRFIE																						
B0680	FUEL FERRYING ASSEMBLY, F/	LVTP5										1			1									
B0685	FUEL SYSTEM, AMPHIBIOUS	ASSAULT, LARGE										1												

Table F-1 (continued)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
80690	FUEL SYSTEM, AMPHIBIOUS ASSAULT, M64																						
80720																							
80730	GENERATOR SET, 3 KW, 60 HZ, SKID MTD																1						
80780	GENERATOR SET, 3 KW, 400 HZ, SKID MTD																1						
80810	GENERATOR SET, PU-667/G, DE, 5KW, 60HZ, SKID																1						
80840	GENERATOR SET, PU-668/G, DE, 5KW, 400HZ, SKI																1						
80890	GENERATOR SET, PU-669/G, DED, 10KW, 60HZ, SKI																1						
80920	GENERATOR SET, PU-670/G, DE, 10KW, 400HZ, SK																1						
80953	GENERATOR SET, 30KW,60HZ,DED																1						
80955	GENERATOR SET, PU-708/G, 30 KW60 HZ, SKID MTD																1						
80970	GENERATOR SET, PU-709/G, 30 KW400 HZ, SKID MT																1						
80980	GENERATOR SET, PU-710/G, 45 KW60 HZ, SKID MTD																1						
81015	GENERATOR SET, PU-711/G, 45 KW400 HZ, SKID MT																1						
81020	GENERATOR SET, PU-712/G, 60 KW60 HZ, SKID MTD																1						
81021	GENRATOR SET, DOD STANDARD, 60KW/60HZ, SKID																1						
81028	GENERATOR SET, DOD STANDARD, 60KW/400HZ, SKI																1						
81045	GENRATOR SET, DOD STANDARD, 100KW/60HZ, SKI																1						
81050	GENERATOR SET, 200KW/60HZ,																1						
81080	GRADER, ROAD, MOTORIZED, ADAMSMOD 550								1														
81135	HELICOPTER EXPEDIENT REFUEL- ING SYSTEM										1												
81140	HYPOCHLORINATION UNIT, WATER													1									
81160	ICE CREAM PLANT, THOMPSON,M-33													2									
81180	ICE MAKING MACHINE, FLAKE, FAM-1494													2									
81200	IMAGERY INTERPRETATION MODULE						1																
81220	KIT, ASSAULT TRACKWAY								1														
81225	LAUNDRY UNIT, M532 TRAILER MOUNTED-L 210 X													1									
81293	LIGHTWEIGHT REPRODUCTION						1																
81302	LUBRICATION AND SERVICING											1											
81325	MIXER, CONCRETE, SHIP LOADER, TRLR MTD, 4 WHE								1														
81330	MODULAR RELOCATABLE BUILDING								1														
81340																							
81350	MOTOR GENERATOR, PU-499/U, 2.5 KW, 60 TO 4																1						
81360	MOTOR GENERATOR, PU-565/U, 4 KW, 60 TO 400																1						
81370	MOTOR GENERATOR, PU-328A/U, 7.5 KW, 60 TO 4																1						
81410	PANTOGRAPH						1																
81420	PETROLEUM TESTING KIT										1												
81430	PHOTO INTERPRETATION SET, TEAM						1																
81440	PHOTO INTERPRETATION SET, UNIT						1																
81450	PHOTOGRAPHIC PRINTING AND PROCESSING SECT						1																
81455	PHOTOGRAPHIC SYSTEM COMBAT						1																
81460	RECTIFIER SECTION						1																
81465	PIPE AND CABLE LAYING MACHINE								1														
81467	PIPE FITTING ASSORTMENT,								1					1									
81470	PLOTTING AND COMPUTING SET						1																
81480	PNEUMATIC TOOL OUTFIT, AIR COMPRESSOR								1														
81500	POWER UNIT, DIESEL, F/SAWMILL,TRLR MTD								1														
81570	PUMP ASSEMBLY, EXPEDIENT REFUELER, FUEL										1												
81580	PUMP, ROTARY DEEP WELL													1									
81590	PUMP RECIPROCATING, MARLOW, 445 MUD-HOG								1														
81595	PUMP, RECIPROCATING, POWER								1					1									
81620	PUMP SET, 55 GPM, 50 FT HEAD										1			1									
81640	RECHARGING UNIT, CARBON DIOXIDE, M4306											1											
81650	REFRIGERATING UNIT, ME-10 F/USE W/150 CU													1									
81660	REFRIGERATOR UNIT, M051E-M62 F/USE W/630 CU										2												
81690	REFRIGERATOR, PREFAB, 150 CU FT													1									
81700	REFRIGERATOR, PREFAB, 630 CU FT										2												
81740																							
81750																							
81755	REPRODUCTION EQUIPMENT SET, TOPOGRAPHIC, TR						1																
81758	REPRODUCTION EQUIPMENT, WHITE						1																
81775	RIPPER ATTACHMENT, THREE SHANK-REAR MOUNTING,								1														
81780	ROLLER TANDEM, 5 TO 8 TON, DED, HUBER-WARC								1														
81790	ROLLER, PNEUMATIC TIRED, TAMPOMOD R-13								1														

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
B1795	ROLLER, TOWED, GRID, MOD	RG-215								1														
B1800	ROLLER, TOWED, SHEEPSFOOT,	MOG-96								1														
B1830	SAW, CHAIN, ONE MAN PORTABLE									1														
B1840	SAW, RADIAL, OVERARM, WOOD-	WORKING, WW-15								1														
B1850	SAW, RADIAL, OVERARM,	WOODWORKING, NO								1														
B1890	SAWMILL, CIRCULAR MODEL RMB									1														
B1895	SAWMILL, CIRCULAR									1														
B1900	SCRAPER, EARTH MOVING, TOWED	CABLE OPERATED,								1														
B1920	SCRAPER, EARTHMOVING, TOWED,	HYDRAULICALLY O								1														
B1925	SCRAPER TRACTOR EARTHMOVING									1														
B1940	SHOP EQUIPMENT, CONTACT MAIN-	TENANCE, TRUCK											1											
B1945	SHOP EQUIPMENT ENGINEER MAIN-												1											
B1950	SHOP EQUIPMENT, GENERAL PUR-	POSE REPAIR, SE											1											
B1960	SHOP EQUIPMENT, ORGANIZATIONAL	REFAIR, LIGHT,											1											
B1970	SHOVEL FRONT, CRANE SHOVEL	BC MOD 37								1														
B2010	SKID ASSEMBLY, SECTIONALI-	ZATION												1										
B2060	SPRAY OUTFIT, PAINT M0091-4500												1											
B2100	SURVEYING SET, ASTRONOMIC	AZIMUTH						1																
B2110	SURVEYING SET, FIELD ARTY BN				1																			
B2120	SURVEYING SET, GENERAL PURPOSE							1																
B2123	TACTICAL INTELLIGENCE IMAGERY							1																
B2130	TANK, FABRIC, COLLAPSIBLE,	3000 GAL, NYLON													1									
B2150	TEST SET, SOIL							1		1														
B2160	THEODOLITE SURVEYING, MOD T-16				1																			
B2180	TOOL ASSEMBLY KIT, DRILLING	MACHINE, STAR 7								1														
B2230	TOOL KIT, DIESEL, ENGINE,	REPAIR											1											
B2250	TOOL KIT, PIONEER, ENGINEER	PLATOON								1														
B2400																								
B2410	TRACTOR FULL TRACKED, LOW	SPEED, MODEL TD								1														
B2444	TRACTOR, FULL TRACKED, SMALL,									1														
B2445	TRACTOR, FULL TRACKED, SMALL,	W/BULLGRADER M-								1														
B2460	TRACTOR, INDUSTRIAL, MRS-200									1														
B2462	TRACTOR, MEDIUM, FULL TRACKED,	MODEL 82-30M TE								1														
B2463	TRACTOR, FULL TRACKED WITH									1														
B2465	TRACTOR, RUBBER TIRED, ARTICU-	LATED STEER, TE								1														
B2467	TRACTOR, RUBBER TIRED, SMALL,									1														
B2468	TRACTOR INDUSTRIAL, WHEELED									1														
B2469	TRACTOR, RUBBER TIRED, SMALL,	W/FRONT END LOA								1														
B2480	TRACTOR, WHEELED, INDUSTRIAL,	MRS-100 M69								1														
B2485																								
B2500	TRANSIT 20 SECOND, W/TRIPOD							1																
B2550	TRUCK, FORKLIFT, ROUGH	TERRAIN, 3000 L												1										
B2560	TRUCK, FORKLIFT, ROUGH TERRAIN,	6000 LB CAP,												1										
B2565	TRUCK, FORKLIFT, ROUGH													1										
B2570	TRUCK, LIFT, FORK, GAS 4000 LBFRT													1										
B2590	TRUCK, LIFT, FORK, GAS, 15000	LB, CAP PRT												1										
B2595	TRUCK, LIFT, FORK, GAS, 15000	LB, CAP PRT												1										
B2600	WATER DISTRIBUTION EQUIPMENT	F/USE W/B2625													1									
B2605	WATER PURIFICATION EQUIPMENT,	SET, MOBILE, ER													1									
B2610	WATER DISTRIBUTION EQUIPMENT	SET, M62, F/USE													1									
B2620	WATER PURIFICATION SET	ERDLATOR, 600 G													1									
B2625	WATER PURIFICATION UNIT, FRAME	MTD, 1500 GPH,													1									
B2680	WELDING MACHINE, ARC, TRLR MTD	MODEL LM62A											1											
B2690	WELDING MACHINE, HARD	SURFACING, MOD,											1											
B2705	WINCH ATTACHMENT, SINGLE DRUM,	F/TRACTOR, MEDI								1														
B2710	WINCH ATTACHMENT, SINGLE DRUM	REVERSIBLE, SIN								1														
B2730	YOKE, TOWING AND LIFTING	F/USE W/500 GAL												1										
C1225	THERMAL GARMENT, SWIMMERS,							1																
C4130	BAKERY PLANT, TRLR MTD											2												
C4410	CLOTHING REPAIR SHOP, TRLR MTD,	-L 160 X W 86-3											2											
C4630	DUPLICATING MACHINE, OFFSET,	MODEL 85 OR EQU						1																
C4435	CONTAINER, AERIAL DELIVERY,																					1		
C4640	DUPLICATING MACHINE, OFFSET,	MODEL 1250 OR E						1																

Table F-1 (continued)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
C4765	EXTINGUISHER FIRE, TWIN AGENT														1								
C5160	LAMINATING MACHINE F/MAPS							1															
C5170	LANDING BOAT, INFLATABLE							1															
C5540	PARACHUTE, CARGO, 100 FT, TYPE G-11A																						
C5760	PRESS,ARBOR, HAND, FLOOR MOUNTING, 8C TO												1										
C6070	SEWING MACHINE, INDUSTRIAL, HEAVY-LEATHER D												1										
C6080	SEWING MACHINE, INDUSTRIAL, ZIG-ZAG ROPE ST												1										
C6090	SEWING MACHINE, INDUSTRIAL, EXTRA HEAVY DUT												1										
C6230	SPRAYER, INSECTICIDE, SKID- MTD, FOG GEN 4C															1							
C6400	TENT, FRAME TYPE, MAINTENANCE MEDIUM												1										
C6405	TENT, FRAME-TYPE, WALL, LIGHT-WEIGHT, EXPANDA														1								
C6440	TEXTILE REPAIR SHOP, TRAILER MOUNTED												2										
D0050	CARRIER, CARGO, AMPHIBIOUS, M116A1 -L 188-1								1														
D0055	CARRIER, CARGO, ARMOR, AMPHIBIOUS, M73								1														
D0080	CHASSIS, TRAILER, 3 1/2 TON 2 WHEEL, M-353					1																	
D0090	CLEANER, STEAM PRESSURE JET, TRAILER MTD -JU												2										
D0110	DOLLY TRAILER, CONVERTER, 6 TON, 2-WHEEL,								1														
D0120	DOLLY TRAILER, CONVERTER, 8 TON, 2-WHEEL,								1														
D0130	DOLLY TRAILER, CONVERTER, 15 TON, M354								1														
D0135	FIREFIGHTING EQUIPMENT, TWIN AGENT UNIT, -MT														1								
D0140	FIREFIGHTING EQUIPMENT SET, TRK, MTD, 530B														1								
D0190	LUBRICATING AND SERVICING UNITPWR OPERATED, 2												1										
D0220	SEMI-TRAILER 65 T HEAVY EQUIP-MENT TRANSPORTE								1														
D0230	SEMI-TRAILER, LOW BED, 25-TON,4-WHEEL, M172A1					1			1														
D0250	SEMI-TRAILER, STAKE, 6-TON, 2-WHEEL, M118A1								1														
D0260	SEMI-TRAILER, STAKE, 12-TON 4-WHEEL, M127A2								1														
D0270	SEMI-TRAILER, REPAIR PARTS SHOP, VAN, 6 TO					1						1											
D0280	SEMI-TRAILER TANK FUEL SERV- ICING, 5000 GAL								1			1											
D0285	SEMITRLR TANK FUEL SERV 5000 GAL M131A4D/M131																				1		
D0290	SEMI-TRAILER, VAN, EXPANSIBLE,6-TON, 4-WHEEL,														1								
D0300	SEMI-TRAILER, VAN REFRIGERATOR7-1/2 TON, 2 WH								1														
D0310	SHOP SET, FM, AUTOMOTIVE BASICCONSISTS OF-												1										
D0320	SHOP SET, FM, AUTOMOTIVE, FUELAND ELECTRICAL												1										
D0330	SHOP SET, FM, AUTOMOTIVE, FUELAND ELECTRICAL												1										
D0340	SHOP SET, FM, AUTOMOTIVE FUEL AND ELECTR												1										
D0350	SHOP SET, FM, AUTOMOTIVE, SUPPLEMENTAL NO												1										
D0360	SHOP SET, FM, AUTOMOTIVE, SUPPLEMENTAL NO												1										
D0430	TESTER, FUEL INJECTOR PUMP L-52 X W-44 X H												1										
D0840	TRAILER, AMPHIB CARGO, 1/4T, 2-WHL, M416B					2																	
D0850	TRAILER, CARGO, 3/4T, 2-WHL, M101A1					2																	
D0860	TRAILER, CARGO, 1-1/2T, 2-WHL,M105A2					2																	
D0875	TRAILER, FLATBED, 3/4 TON, 2 WHEEL, M762					1																	
D0878	TRAILER, OIL SALVAGE AIRCRAFT																				1		
D0880	TRAILER, TANK, WATER, 400 GAL,M149					1									1								
D0885	TRAILER, UTILITY,2-1/2 TON,																				1		
D0888	TRUCK ACFT REFUELER 2000 GAL M63A2																				1		
D0890	TRUCK, AMBULANCE, 1/4T, 4X4, M718															1							
D0900	TRUCK, AMBULANCE, 3/4T, 4X4, M43B1															1							
D0989	TRUCK, AMBULANCE, 4X4, 1-1/4 TON, M725 -GM-6															1							
D1000	TRUCK AMBULANCE 1 1/4 T 6 X 6 M792															1							
D1010	TRUCK, CARGO, 3/4T, 4X4, M37B1W/W -L 190 W 74					1																	
D1020	TRUCK, CARGO, 1 1/4T, 6X6, M561, W/WINCH					1																	
D1030	TRUCK, CARGO, DROPSIDE, 2-1/2T6X6, M35A2C, W/					1			1														
D1040	TRUCK, CARGO, 2-1/2T, M36A2 W/OW,W/E -L 336					1			1														
D1050	TRUCK, CARGO, 5 TON, 6X6, M54A2C, W/O WIN					1			1														
D1060	TRUCK, CARGO, 5T, 6X6, M55A2, W/O WINCH, W/PT					1			1														
D1070	TRUCK, DUMP, 5 TON, 6X6, M51A2W/O WINCH W/PTO									1													
D1078	TRUCK, EARTH BORING, 2-1/2TON,6X6, V18,A/MTO						1			1													
D1080	TRUCK, FIREFIGHTING, 1/4-TON, 4X4, MODEL MC 1														1								
D1090	TRUCK, TELEPHONE LINE MAINT, 2-1/2-T, 6X6, V						1																
D1095																					1		
D1100	TRUCK, PLATFORM, UTILITY, 1/2T4X4, M274A2					1			1														
D1110	TRUCK, TANK, FUEL SERVICING, 1200 GAL, 2-1/2								1						1								

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
D1120	TRUCK, TANK, WATER, 100J GAL, 2-1/2T, 6X6, M5														1								
D1130	TRUCK, TRACTOR, 5T, 6X6, M52A2W/O WINCH, W/PT								1														
D1140	TRUCK, TRACTOR, 10T, 6X6, M123A1C								1														
D1143	TRUCK, TRACTOR, 10 TON 6X6, M123E2 -L 28J W								1														
D1160	TRUCK, UTILITY, 1/4T, 4X4, M151A1, -L 132					1																	
D1180																							
D1186	TRUCK, UTILITY, 1-1/4 TON, 4X4M715, W/O WN -O																				1		
D1190	TRUCK, VAN, 2-1/2T, 6X6, M109A3, W/OW, W					1							1										
D1210	TRUCK, WRECKER, 5T, 6X6,M543A2-L 310 W 97 H H												1										
E0130	BOARD, PLOTTING, M5A2				1																		
E0140	BORESCOPE, M2, 57-280MM												1										
E0151	CABLE ASSEMBLY SET, ELECTRICAL-HAWK- AN/GSA-1																		1				
E0180	CIRCLE, AIMING, M2		1		1																		
E0230	COMPRESSOR, RECIPROCATING, POWER DRIVEN, F		1										1										
E0240	COMPRESSOR, RECIPROCATING, POWER DRIVEN, 5			1									1										
E0250	COMPUTER, GUN DIRECTION, M18				1																		
E0260	CONSOLE, ASSAULT, FC, GM, AN/TSW-4 SERIES																		1				
E0270	CONTROL BOX, GM LAUNCHING SECTION, AN/GSA																		1				
E0271	CONTROL BOX, GM LAUNCHING SECTION, AN/GSA																		1				
E0320	DISPERSER, RIOT CONTROL AGENT,PORTABLE, M3, W		1																				
E0390	FIXTURE, CROSS LEVEL AND ELEVATION, W/E												1										
E0420	FIXTURE, PERISCOPE, COLLIMAT- ING, W/E F/M15												1										
E0440	FLAMETHROWER, PORTABLE, M9-7		1																				
E0540	GUIDED MISSILE BASE, MAINT SHOP EQUIPMENT,																						1
E0550	PLATOON COMMAND POST, AN/MSW-9GM-HAWK																		1				
E0560	GUIDED MISSILE, CONTROL CENTRAL, AN/TSW																		1				
E0561	GUIDED MISSILE BATTERY CONTROLCENTRAL, AN/TSW																		1				
E0563																			1				
E0570	GUIDED MISSILE -HAWK- M16																		1				
E0605	GUN, SELF-PROPELLED, FT,175MM,M107, W/E -L 37			1																			
E0640	HOWITZER, LT TOWED, 105MM M101A1 W/E			1																			
E0660	HOWITZER, MEDIUM, SELF- PROPELLED 155MM			1																			
E0663	HOWITZER, MEDIUM, SELF- PROPELLED, M109			1																			
E0670	HOWITZER, MED TOWED, 155MM, M114A1 W/E			1																			
E0690	HOWITZER, 8IN, SELF-PROPELLED,M110, W/RADIO S			1																			
E0692	HOWITZER, 8IN,HEAVY,SELF			1																			
E0697	IMPROVED PLATOON COMMAND IPCP																		1				
E0700	INFORMATION COORDINATION CEN- TRAL AN/MSQ-95																		1				
E0720	INSTALLATION KIT, BOOM CRANE, -HAWK-																		1				
E0760	KIT,FIELD HANDLING TRAINER																		1				
E0780	KIT, NIGHT DRIVING, INFRA-RED,LVT M1								1														
E0795	LANDING VEHICLE, TRACKED COM-								1														
E0800	LANDING VEHICLE, TRACKED ENGINEER, LVTE1										1												
E0805											1												
E0810	LANDING VEHICLE TRACKED HOW MOD 6 LVTH6A1 A			1																			
E0820	LANDING VEH TRACKED HOW MOD 6 LVTH6A1 ARMD AH			1																			
E0830	LANDING VEHICLE TRACKED LVTP5A1 W/E W/R								1														
E0840	LANDING VEHICLE TRACKED LVTP5A1 -COMMAN								1														
E0845	LANDING VEHICLE TRACKED, PERSONNEL, MODE								1														
E0850	LANDING VEHICLE TRACKED RECOVERY MOD 1												1										
E0855	LANDING VEHICLE TRACKED,												1										
E0890	LAUNCHER, GRENADE, 40MM, M79 W/E		1																				
E0900	LAUNCHER, INCENDIARY ROCKET,		1																				
E0910	LAUNCHER, ROCKET, GROUND, DEMOLITION KIT,										1												
E0920	LAUNCHER, RKT, 3.5IN, M20A1 W/E		1																				
E0940	LAUNCHER, ZERO LENGTH, GM, XM78 SERIES -HA																		1				
E0941	LAUNCHER, ZERO LENGTH, GM, XM-192, -I HAWK																		1				
E0945	LOADER TRANSPORTER, GM, XM501 SERIES -H																		1				
E0950	MACHINE GUN, CAL. 30, BROWNINGM1919A4 W/E		1																				
E0970	MACHINE GUN, CAL 30, M37		1																				
E0980	MACHINE GUN, CAL. 50, BROWNINGM2, HB FLEXIBLE		1																				
E0990	MACHINE GUN 7.62MM M60		1																				
E1015	MAINTENANCE SET, DIRECT												1										

Table F-1 (continued)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
E1020	MAINTENANCE SET, GENERAL																						
E1033	METEOROLOGICAL STATION MANUAL,AN/TMQ-4			1																			
E1036	METEOROLOGICAL STATION MANUAL,AN/TMQ-7			1																			
E1039	MISSILE MAINTENANCE SHOP AN/GSM-216 -RED																						
E1040	MIXING AND TRANSFER UNIT, INCENDIARY OIL,		1																				
E1055	MONITORING SET,GUIDED MISSILE															1							
E1060	MORTAR, INFANTRY, 60MM, M19/M2	1																					
E1070	MORTAR, ARTY, 107MM, M30 W/E		1																				
E1090	MORTAR, INF, 81MM, M29 W/E	1																					
E1160	OPERATIONS CENTRAL, AN/TSQ-39 -HAWK-															1							
E1165	PERISCOPE, BC, M65, W/E			1			1																
E1170	PISTOL, AUTOMATIC, CAL 22, SPORT MOD	2																					
E1180	PISTOL, AUTO, CAL 45, M1911A1,W/HOLSTER, SHOU	1																					
E1273	RADAR CHRONOGRAPH SET, 136, AN/GPS-5						1																
E1290	RADAR SET, AN/MPQ-34 SERIES -HAWK-															1							
E1300	RADAR SET, AN/MPQ-35 SERIES -HAWK-															1							
E1310	RADAR SET, AN/MPQ-37 SERIES -HAWK-															1							
E1311	RADAR SET, AN/MPQ-46 -XO-1- -HPI- -I HAWK-															1							
E1313	RADAR SET, AN/MPQ-48 -XO-1- -ICWAR- -I HAWK															1							
E1315	RADAR SET, AN/MPQ-50 -XO-1- -PAR- RIFL															1							
E1318	RADAR SET, AN/MPQ-51 -XO-1- -ROR- -I HAWK-															1							
E1320	RADAR SET, AN/MPQ-39 -HIGH POWER ILLUMINAT															1							
E1322	RADIOSONDE BASELINE CHECK SET,AN/GMM-1										1												
E1324	RADIOSONDE RECORDER, AN/TMQ-5A			1																			
E1342	RAWIN SET, AN/GMD-1			1																			
E1360	RECOVERY VEHICLE, FULL TRACK- M51, W/E, W/RAD										1												
E1375	RECOVERY VEHICLE FULL TRACKED LIGHT M578										1												
E1390	REPRODUCER, SIGNAL DATA AN/GSC-64						1																
E1400	REVOLVER, CAL 38, S AND W, W/E W/HOLSTER	1																					
E1403	REVOLVER, CAL 38, S AND W, MODEL 10, W/E I	1																					
E1440	RIFLE, 5.56MM, M16A1, W/E	1																					
E1450	RIFLE, 7.62MM, M14, W/E	1																					
E1460	RIFLE, 7.62MM SNIPER, M40, W/E	1																					
E1480	RIFLE, 106MM, M40A1C, W/E -MT M92 TRIPOD M27	1																					
E1570	SHOP EQUIP - NO. 2- GM REMOTE CONTROL SYSTEM,																				1		
E1580	SHOP EQUIP -NO. 3- GM REMOTE CONTROL SYSTEM,																				1		
E1590	SHOP EQUIP -NO. 4- GM, FM/ AN/TSM-43 -																				1		
E1600	SHOP EQUIP -NO. 5- GM, FM- XM2 -HYDRAU																				1		
E1610	SHOP EQUIP -NO. 6- GM, FM/ AN/TSM-45 -																				1		
E1620	SHOP EQUIP -NO. 7- GM, FM/ AN/TSM-46 -																				1		
E1630	SHOP EQUIP, GM, OM, AN/MSM-43 SERIES -HAWK-																				1		
E1640	SHOP EQUIPMENT, GM, REMOTE CONTROL SYSTEM,																				1		
E1642	SHOP EQUIPMENT, GM, REMOTE CONTROL SYSTEM,																				1		
E1644	SHOP EQUIPMENT, GM, REMOTE CONTROL SYSTEM,																				1		
E1646	SHOP EQUIPMENT, GM, REMOTE CONTROL SYSTEM,																				1		
E1648	SHOP EQUIPMENT, GM, REMOTE CONTROL SYSTEM,																				1		
E1649	SHOP EQUIPMENT, GM, REMOTE CONTROL SYSTEM,																				1		
E1660	SHOP SET, FM, BASIC, INSTRUMENT AND										1												
E1670	SHOP SET, FM, CONTACT AND EMERGENCY REPAI										1												
E1680	SHOP SET, MACHINE BASIC, COMPOSED OF										1												
E1690	SHOP SET, FM, MACHINE, HEAVY, COMPOSED OF										1												
E1700	SHOP SET, FM, MACHINE, HEAVY, SUPPL NO. 1, CO										1												
E1710	SHOP SET, FM, MOBILE, ARTY W/ SET, SUPPL NO 1										1												
E1720	SHOP SET, FM, SMALL ARMS, COMPOSED OF										1												
E1730	SHOP SET, FM, WELDING, COMPOSED OF										1												
E1760	SHOTGUN, 12 GAUGE, MODEL 870, MK 1	1																					
E1790	SIMULATOR STATION RADAR SIGNALHAWK GUIDED MIS																						
E1791	SIMULATOR STATION RADAR SIGNALGUIDED MISSILE																						
E1840	TANK, COMBAT, FULL TRACKED, FLAMETHROWER M6		1																				
E1850	TANK, COMBAT, FULL TRACKED, 90MM GUN, M48A3 W		1																				
E1860	TANK, COMBAT, FULL TRACKED, 90MM GUN, M48A2,		1																				
E1870	TANK, COMBAT, FULL TRACKED, 120MM GUN M103A		1																				
E1900	TELESCOPE, OBSERVATION, M49, W/E						1																

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
E1910	TEST SET, COMPUTER LOGIC	AN/GSM-70										1												
E1915	TEST SET, GUIDED MISSILE,																					1		
E1920	TEST SET, GUIDED MISSILE	SYSTEM, AN/TSM-																				1		
E1945	TEST SET, GUIDED MISSILE,TEST	EQUIPMENT, TS-2																				1		
E2710	TOOL KIT, PORTABLE, FLAME-	THROWER M31										1												
E3175	TRACKER, INFRARED, GUIDED		1																					
E3192	TRAINER, LAUNCH EFFECTS,		2																					
E3195	TRAINING SET, GUIDED MISSILE	SYSTEM, XM76 -R	2																					
E3197	TRANSMITTER, INFRARED T1105		1																					
E3360	XENON SEARCHLIGHT, VEHICLE	MOUNTED		1																				
T1000	UNATTENDED GROUND SENSOR/							1																
T1010	UNATTENDED GROUND SENSOR/							1																
T1015	UNATTENDED GROUND SENSOR/ADD-							1																
T1040	UNATTENDED GROUND SENSOR/AIR							1																
T1050	UNATTENDED GROUND SENSOR-AIR							1																
T2022	UNATTENDED GROUND SENSOR/							1																
T2023	UNATTENDED GROUND SENSOR/							1																
T2024	UNATTENDED GROUND SENSOR/							1																
T2025	UNATTENDED GROUND SENSOR/DOWN							1																
T2026	UNATTENDED GROUND SENSOR/							1																
T2027	UNATTENDED GROUND SENSOR/							1																
T2028	UNATTENDED GROUND SENSOR/							1																
T2029	UNATTENDED GROUND SENSOR/							1																
T2030	HEATER, SPACE, HD-1/U													1										
T2032	UNATTENDED GROUND SENSOR/							1																
T2041	UNATTENDED GROUND SENSOR/							1																
T2042	INATTENDED GROUND SENSOR/MICRO							1																
T2044	UNATTENDED GROUND SENSOR/							1																
T2045	UNATTENDED GROUND SENSOR/							1																
T2046	UNATTENDED GROUND SENSOR/							1																
T2048	UNATTENDED GROUND SENSOR/							1																
T2049	UNATTENDED GROUND SENSOR/							1																
T2050	TRAINER, TELEGRAPHIC CODE,	AN/FGC-T2					2																	
T2051	UNATTENDED GROUND SENSOR/							1																
T2053	UNATTENDED GROUND SENSOR/							1																
U3044	BOAT, LOGISTIC SUPPORT								1															
U3045	BRIDGE, 60 FT SINGLE SPAN,	DOUBLE LANE								1														
U3047	BUILDING, RELOCATABLE,	QUONSET, NOTHER								1														
U3048	BUILDING, RELOCATABLE,	QUONSET, SOUTHE								1														
U3050	COMPASS, SUN*							1																
U3054																								
U3080	DISTILLATION UNIT, WATER, 200	GPH, TRAILER MT												1										
U3085	DISTRIBUTOR, BITUMINOUS,	MATERIAL, TANK								1														
U3090	DRILLING MACHINE, ROTARY,	TRAILER, MTD																						
U3096	EDGER, SAWMILL, MOD 04-26									1														
U3110	GYRO COMPASS EQUIPMENT,							1																
U3117	HYPOCHLORINATION UNIT, WATER	PURIFICATION, F												1										
U3120	ION EXCHANGE UNIT													1										
U3150	MAT, LANDING, STEEL, L 105FT,	W 10 FT								1														
U3170	MIXER, ROTARY TILLER									1														
U3172	MODULAR RELOCATABLE HEAD									1														
U3175	MODULAR RELOCATABLE BUILDING									1														
U3173	MODULAR RELOCATABLE 80-MAN									1														
U3174	MODULAR RELOCATABLE 50-MAN									1														
U3176	MODULAR RELOCATABLE CLASSROOM/									1														
U3177	MODULAR RELOCATABLE HANGAR									1														
U3178	MODULAR RELOCATABLE MAINTEN-									1														
U3179	MODULAR RELOCATABLE MULTI-USE									1														
U3181	PUTBOARD MOTOR, LONG SHAFT									1														
U3183	PILE DRIVER, SELF-POWERED									1														
U3235	PUMP, DEEP WELL																							
U3245	SHOVEL FRONT, CRANE SHOVEL	KOEHRING MOD 2N								1														
U3250	SKID, LAUNCHING, LANDING MAT									1														

Table F-1 (concluded)

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
U3270	TANK, LIQUID, STORAGE, METAL, 100 GAL *													1										
U3272	TRAILER, EXTENDIBLE 35-50 FT							1																
U3280	TRACTOR, WALKING, POWER DRIVENMOD 22-4E								1															
U3290	TRAMWAY, SET, AERIAL							1																
U3292	TRAMWAY SET -F/USE WITH							1																
U3320	WINTERIZATION KIT, CRANE,	BAY CITY, MOD 3							1															
U3300																								
U3330	WINTERIZATION KIT, CRANE,	KOEHRING, MOD 2							1				1											
U3350	WINTERIZATION KIT, GRADER,	ADAMS 550 *							1															
W5016	VEHICLE ANTIFRAGMENTATION	ARMOR KIT, BED						1																
W5017	VEHICLE ANTIFRAGMENTATION	ARMOR KIT, BED,						1																
W5018	VEHICLE ANTIFRAGMENTATION	ARMOR KIT, CAB						1																
W5019	VEHICLE ANTIFRAGMENTATION	ARMOR KIT, CAB						1																
W5040	ARCTIC WINTERIZATION KIT							1																

VII EVALUATION OF ITEM IMPORTANCE TO UNITS

To determine how each item of equipment relates to a unit's primary and secondary operational functions, it was first necessary to specify 22 discrete functions that units may perform. These functions are listed below. The nature of each function is self-evident in the listing, but in some cases it was necessary to add qualifying constraints to discriminate equipment use in the functions. An obvious example of this discrimination is in the mobility and transportation functions. Both of these functions are in the general function of movement of personnel and materiel. However, more specific equipment use is defined by dividing this general function into mobility, which includes unit movement/displacement, and internal movement of personnel and transportation, which includes all other forms of surface movement of personnel and materiel. The functions, together with their respective qualifying constraints, are as follows:-

- Infantry Combat Small Arms Employment

  Employment of individual and crew served weapons up to and including 81mm mortar and the 106 recoilless rifle--does not include 4.2" mortar.

- Fire Support

  Employment of equipment used directly for delivery of fire support, including 4.2" mortar, 105mm howitzer and larger.

- Fire Support Control

  Fire direction and supporting arms coordination.

- Mobility

  Unit movement/displacement; internal movement of personnel.

- <u>Communications</u>

  Operational communications only.

- <u>Intelligence</u>

  Collecting and processing of intelligence. Functional importance rating does not necessarily reflect the unit's need for intelligence--e.g., a unit may have a great need to receive the finished product, but have no equipment for collecting and processing intelligence.

- <u>Surface Transportation</u>

  Transportation of personnel and material <u>external</u> to the unit, and transportation of supplies for <u>internal</u> unit distribution; supply point distribution for unit, and/or logistic support.

- <u>Engineer Construction</u>

- <u>Demolition/Obstacle Clearance</u>

- <u>Supply</u>

- <u>Maintenance</u>

  Equipment maintenance other than communications/ electronics and aviation.

- <u>Cargo Handling</u>

- <u>Service Support</u>

  Combat service support functions other than engineer construction, supply, maintenance, cargo handling, medical, transportation, and power generation.

- <u>Medical</u>

- <u>Air Support Control</u>

- <u>Power Generation</u>

- <u>Ordnance Delivery</u>

  Equipment in this category limited to LAAM, FAAD, and MASS. Includes actual delivery and control of delivery. If aircraft were in the LM2 cards, they would be in this category. GSE for activities such as rearming are in A/C maintenance category.

- Air Control

  Air control functions other than Air Support Control and Air Traffic Control.

- Air Operations Support

  Air Traffic Control and ground support operations, other than maintenance, that are unique to aircraft operation.

- Air Transport

  Equipment in this category includes items used in delivery of material by air transport--e.g., aerial delivery containers.

- Communications/Electronics Maintenance

- Aviation Maintenance

The assigned mission of each organization was then examined, and each of the 22 functions was classed as follows:

A: Primary

B: Secondary--directly affects primary

C: Tertiary--affects general performance of unit.

Functions that did not fall into these categories were designated as non-applicable. The functions for two units (M1038 and M1758) are classified in Tables F-2 and F-3.

Table F-2

M1038 INFANTRY BATTALION FUNCTIONS,
BY RELATIVE IMPORTANCE

Primary Functions (A)

- Infantry Combat/SA Employment
- Mobility
- Communications

Secondary Functions (B)

- Intelligence
- Demolition/Obstacle Clearance
- Medical
- Air Support Control
- Power Generation
- Comm/Elect Maintenance

Tertiary Functions (C)

- Supply
- Maintenance (except Comm/Elect)
- Service Support

Table F-3

M1758 SERVICE BATTALION FUNCTIONS,
BY RELATIVE IMPORTANCE

Primary Functions (A)

- Surface transportation
- Supply
- Maintenance (except Comm/Elect)
- Service Support
- Comm/Elect Maintenance

Secondary Functions (B)

- Engineer construction
- Cargo handling
- Power Generation

Tertiary Functions (C)

- SA Employment
- Mobility
- Communications
- Intelligence
- Medical

Table F-4 is a full listing of the functions in each of the three categories for each unit. Each principal item was classified as either equipment that performs a primary, a secondary, or no role in fulfilling each of the 22 functions. Secondary classification was assigned only in a few cases where it was clearly indicated. For example, D1160 1/4-ton truck (M151A1) is classified as making a primary contribution to mobility, and no contribution to any of the other functions. Table F-1 lists the functional uses of each of the equipment items, by TAM number.

To determine an item's importance to a unit, one scans all uses for which that item has primary application. If primary application is found in any function that is a primary function of the unit, the item is determined to be a high priority item to that unit. If an item is not a high priority item, but it has secondary application in a primary function or primary application in a secondary function it is called a medium priority item. If the item has application in tertiary function or secondary application in a secondary function it is called a low priority item. A process of refinement of unit function and item use designations caused all TAM items in the EAF to be found in one of these three priority levels--high, medium, or low. (Maintenance float items were tabulated separately without consideration of priority.)

The EAF was then searched for equipment to be found in each unit; each item was classified to be of high, medium, low, or nonpriority. Full listings of individual items for each unit were also obtained, but they are too extensive to appear in this appendix.

Table F-4

(1)

LIST OF UNIT FUNCTIONS, BY RELATIVE IMPORTANCE

	(1) S.A. Employ-ment	(2) Fire Support	(3) Fire Support Control	(4) Mobility	(5) Comm.	(6) Intell.	(7) Transport	(8) Engr. Constr.	(9) Demo-lition	(10) Supply	(11) Maint. (-)	(12) Cargo Handling	(13) Service Support (-)	(14) Med.	(15) Air Support Control	(16) Power Gener.	(21) C.E. Maint.
Infantry Recon.																	
M1038	A	-	-	A	A	B	-	-	B	C	C	-	C	B	B	B	B
M1428	B	-	-	A	A	A	-	-	C	C	C	-	C	B	-	B	B
M4623	B	-	-	A	A	A	-	-	B	C	C	-	C	C	-	B	B
Artillery																	
M1128	B	A	A	A	A	B	B	B	C	C	B	B	C	B	-	B	B
M1138	B	A	A	A	A	B	B	B	C	C	B	B	C	B	-	B	B
M1148	B	A	A	A	A	B	B	B	C	C	B	B	C	B	-	B	B
M4112	B	A	A	A	A	B	B	B	C	C	B	B	C	B	-	B	B
M4192	B	A	A	A	A	B	B	B	C	C	B	B	C	B	-	B	B
M4193	B	A	A	A	A	B	B	B	C	C	B	B	C	B	-	B	B
M4201	B	A	A	A	A	B	-	-	-	C	B	-	C	B	-	B	B
Combat Tracked Veh.																	
M4238	B	A	-	A	A	C	B	C	-	C	B	B	C	B	-	B	B
M4239	B	A	-	A	A	C	B	C	-	C	B	B	C	B	-	B	B
M4655	C	-	-	A	A	C	A	C	-	C	B	-	C	C	-	B	B
M4658	C	-	-	A	A	C	A	C	-	C	B	-	C	C	-	B	B
M4659	C	-	-	A	A	C	A	C	-	C	B	-	C	C	-	B	B
M4682	B	A	A	A	A	-	-	B	-	C	B	-	C	C	-	B	B
Ground Combat Command & Civil Affairs																	
M1096	C	-	-	B	A	A	-	-	-	C	C	-	B	C	B	B	B
M1196	C	-	A	B	A	A	C	-	C	C	C	-	B	C	-	B	B
M1988	C	-	A	B	A	A	C	-	-	C	C	-	B	C	B	B	B
M4226	C	-	A	B	A	A	B	-	-	C	C	-	B	C	-	B	B
M4918/19	C	-	A	B	-	A	C	-	-	C	C	-	B	C	B	B	-
M1996	C	-	A	B	A	A	C	-	-	C	C	-	B	C	B	B	B
M4998	C	-	-	A	-	-	-	-	-	C	C	-	C	A	-	B	-
Engineer/Shore Party																	
M1378	C	-	-	B	B	B	C	A	A	C	B	-	A	C	-	B	B
M1868	B	-	-	C	A	B	C	B	C	C	B	A	C	A	-	B	B
M4343	C	-	-	B	C	-	C	A	B	C	B	-	C	C	-	B	C
M4358	C	-	-	C	B	B	C	A	B	C	B	-	B	C	-	B	B
M4392	C	-	-	B	C	A	-	-	-	C	-	-	C	-	-	C	-

Note: Column numbers are keys to equipment use designations in Appendix C.

A = Primary importance.
B = Secondary importance.
C = Tertiary importance.

Table F-4 (continued)

(II)

LIST OF UNIT FUNCTIONS, BY RELATIVE IMPORTANCE

	(1) S.A. Employment	(2) Fire-Support	(3) Fire Support Control	(4) Mobility	(5) Comm.	(6) Intell.	(7) Transport	(8) Engr. Constr.	(9) Demolition	(10) Supply	(11) Maint. (-)	(12) Cargo Handling	(13) Service Support	(14) Med.	(15) Air Support Control	(16) Power Gener.	(20) Air Transport	(21) C.E. Maint.	(22) Avn. Maint.
Motor Transport																			
M1658	C	-	-	B	B	C	A	-	-	C	B	-	C	C	-	B	-	C	-
M4648	C	-	-	B	B	C	A	-	-	C	B	-	C	C	-	B	-	C	-
Communications/Control																			
M4843	C	-	-	B	A	B	-	-	-	C	B	-	C	C	-	B	-	B	-
M4852	B	-	A	B	A	B	-	-	-	C	C	-	C	C	A	B	-	B	-
M4853	B	-	A	B	A	-	-	-	-	C	C	-	C	C	A	B	-	B	-
M4888	C	-	-	B	A	-	-	C	-	C	B	-	C	C	-	B	-	B	-
Intelligence/Security																			
M4722	C	-	-	B	C	A	-	-	-	-	-	-	-	-	-	C	-	-	-
M4724	C	-	-	B	C	A	-	-	-	-	-	-	-	-	-	C	-	-	-
M4732	C	-	-	B	A	A	-	-	B	C	C	-	C	-	-	B	-	B	-
M4738	C	-	-	B	A	A	C	-	B	C	C	-	B	C	-	B	-	B	-
M4908	B	-	-	A	A	B	C	-	-	C	C	-	C	C	-	B	-	B	-
Medical																			
M1558	C	-	-	B	B	-	A	-	-	B	C	-	C	A	-	B	-	C	-
M4512	C	-	-	C	C	-	-	-	-	B	C	-	B	A	-	B	-	C	-
M4552	C	-	-	C	C	-	-	-	-	B	C	-	C	A	-	B	-	C	-
M4592	C	-	-	C	C	-	-	-	-	B	C	-	B	A	-	B	-	C	-
Supply/Maint./Service Support																			
M1758	C	-	-	C	C	C	A	B	-	A	A	B	A	C	-	B	-	A	-
P1758	C	-	-	C	C	C	A	B	-	A	A	B	A	C	-	B	-	A	-
M3248	C	-	-	C	-	-	B	-	-	C	A	-	B	-	-	B	-	A	A
P3333	C	-	-	C	-	-	-	C	-	A	B	B	B	-	-	B	-	C	-
M3348	C	-	-	C	-	-	A	C	B	A	C	C	C	C	-	B	-	B	-
M3448	C	-	-	B	A	C	A	B	C	C	B	A	A	B	-	B	A	B	-

Table F-4 (continued)

(III)

LIST OF UNIT FUNCTIONS, BY RELATIVE IMPORTANCE

	(1) S.A. Employment	(4) Mobility	(5) Comm.	(6) Intell.	(7) Surface Transport	(8) Engr. Constr.	(9) Demolition	(10) Supply	(11) Maint. (-)	(12) Cargo Handling	(13) Service Support	(14) Med.	(15) Air Support Control	(16) Power Gener.	(17) Ord. Delivery	(18) Air Control	(19) Air Opns. Support	(20) Air Transport	(21) C.E. Maint.	(22) Avn. Maint.
Air Command Control																				
M8610 / M8611	C	B	-	A	C	C	C	B	C	C	A	A	A	B	-	A	-	-	B	-
M8612	C	C	A	-	C	C	-	C	C	C	B	-	B	B	-	B	-	-	B	-
M8615	C	B	-	C	C	C	C	B	C	C	A	B	A	B	-	A	-	-	B	-
M8630	B	C	B	-	C	C	-	C	C	C	B	C	-	B	-	A	-	-	B	-
M8631	B	C	B	-	C	C	-	C	C	C	B	C	-	B	-	A	-	-	B	-
M8640	B	B	B	C	C	C	-	C	C	C	B	C	A	B	-	-	-	-	B	-
Air Command/Maint.																				
M8710	C	C	C	-	B	B	C	A	C	B	A	B	-	B	-	-	-	A	C	A
M8715	C	C	C	-	C	C	-	C	A	C	C	-	-	B	-	-	-	-	C	A
M8813	C	B	C	C	C	C	C	A	C	C	C	-	-	B	-	-	-	B	C	A
M8913	C	B	C	C	C	C	-	A	C	C	C	-	-	B	-	-	-	B	C	A
Air Operations Support																				
M8820	C	C	B	-	B	C	C	A	B	A	A	B	-	B	-	-	A	-	B	A
M8821	C	C	A	-	-	-	-	C	C	-	C	-	-	B	-	-	A	-	B	-
M8920	C	C	B	-	B	C	C	A	B	A	A	B	-	B	-	-	A	-	B	A
M8712	C	C	-	-	-	-	-	C	C	C	C	-	-	B	-	-	A	-	A	-
Fighter/Attack																				
M8835	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8844	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8847	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8848	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8855	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8857	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8859	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8968	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
M8969 / M8970	C	C	C	B	C	C	-	C	C	B	C	C	-	B	A	-	B	-	C	A
Air Transport																				
M8762	C	C	C	-	C	C	-	C	C	C	C	C	-	B	-	-	B	A	C	A
M8780	C	C	C	C	C	C	-	B	C	C	C	C	-	B	-	-	B	A	C	A
M8932	C	C	C	C	C	C	-	B	C	C	C	C	-	B	-	-	B	A	C	A
M8937	C	C	C	C	C	C	-	B	C	C	C	C	-	B	-	-	B	A	C	A
M8944	C	C	C	C	C	C	-	B	C	C	C	C	-	B	-	-	B	A	C	A
M8963	C	C	C	C	C	C	-	B	C	C	C	C	-	B	-	-	B	A	C	A

Table F-4 (concluded)

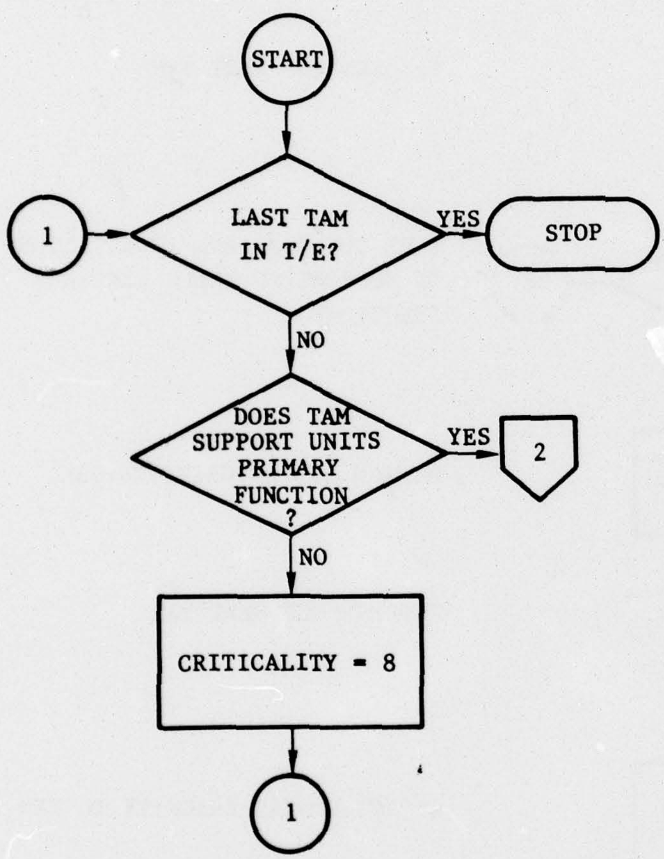
(IV)

LIST OF UNIT FUNCTIONS, BY RELATIVE IMPORTANCE

	(1) S.A. Employment	(4) Mobility	(5) Comm.	(6) Intel.	(7) Ground Support	(8) Engr. Constr.	(9) Demolition	(10) Supply	(11) Maint. (-)	(12) Cargo Handling	(13) Service Support	(14) Med.	(15) Air Support Control	(16) Power Gener.	(17) Ord. Delivery	(18) Air Control	(19) Air Opns. Support	(20) Air Transport	(21) C.E. Maint.	(22) Avn. Maint.
Aviation Intelligence																				
M8651	C	C	C	A	C	C	-	C	C	C	C	C	-	B	-	-	B	-	C	A
M8652	C	C	C	A	C	C	-	C	C	C	C	C	-	B	-	-	B	-	C	A
M8653	C	C	C	A	C	C	-	C	C	C	C	C	-	B	-	-	B	-	C	A
M8654	C	C	C	A	C	C	-	C	C	C	C	C	-	B	-	-	B	-	C	A
M8660	C	C	C	A	C	C	-	C	C	C	C	C	-	B	-	-	B	-	C	A
Missile																				
M8622	B	B	B	B	B	C	-	B	C	C	B	C	-	B	A	-	-	-	B	B
M8625	B	B	B	-	-	-	-	C	C	-	C	C	-	B	A	-	-	-	C	B

VIII FLOW DIAGRAM OF CRITICALITY COMPUTATION

The criticality computation for TAMs within a T/E is logically summarized in Figure F-1.



PROCESS EACH TAM IN UNIT'S AUTHORIZED T/E

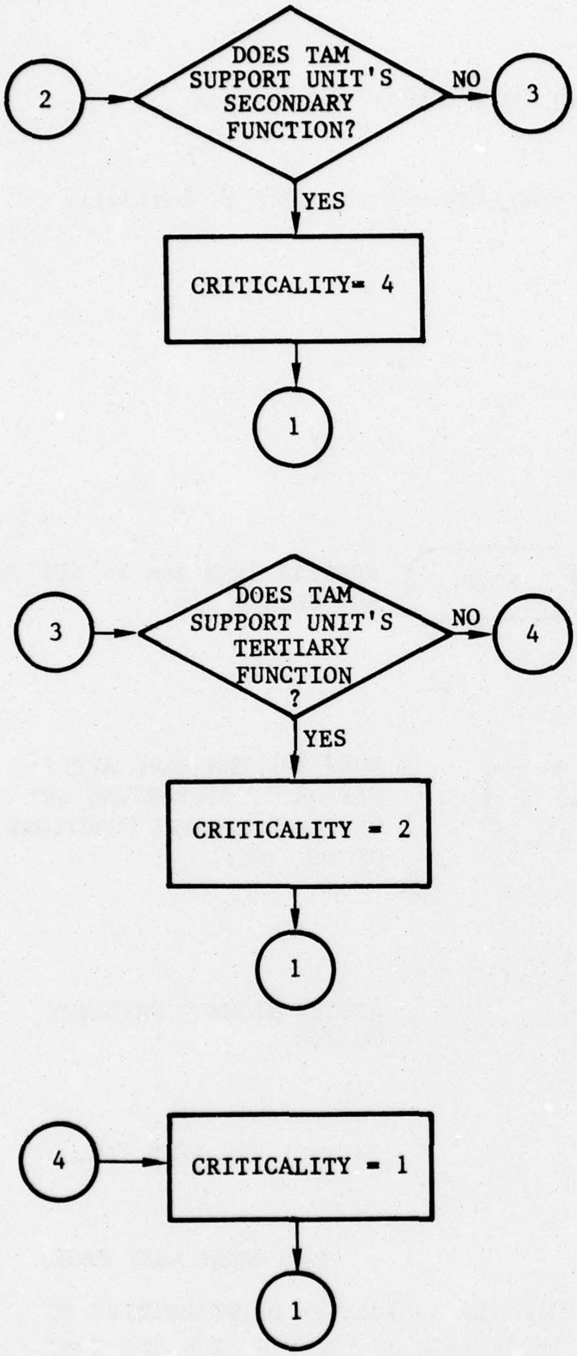
DOES THE TAM HAVE APPLICATION IN SUPPORTING ANY OF THE PRINCIPAL FUNCTIONS OF THE UNIT?

ASSIGN HIGHEST PRIORITY TO TAM

PROCESS THE NEXT TAM

(CONTINUED NEXT PAGE)

FIGURE F- 1. FLOW DIAGRAM ILLUSTRATING THE ASSIGNMENT OF PRIORITIES TO TAMS ACCORDING TO THE IMPORTANCE OF THE FUNCTION THE TAMS SUPPORT WITHIN THE UNIT



DOES TAM HAVE APPLICATION IN SUPPORTING UNIT'S SECONDARY FUNCTION?

ASSIGN MEDIUM PRIORITY TO TAM

PROCESS THE NEXT TAM

DOES THE TAM HAVE APPLICATION IN SUPPORTING UNITS TERTIARY FUNCTION?

ASSIGN LOW PRIORITY TO TAM

PROCESS THE NEXT TAM

ASSIGN LOWEST PRIORITY TO TAM

PROCESS THE NEXT TAM

FIGURE F- 1 . (CONCLUDED)

IX THE CONTEAM MODEL

A. Introduction

The CONTEAM model is a computerized planning aid to assist the operational planner-officer in deciding which items of materiel he must leave behind when preparing a load list under cube and/or square loading constraints due to reduced shipping availability.

A brief, nontechnical description of the model follows.

B. Input Parameters Required for the CONTEAM Model

For the algorithm it is necessary to have the following input parameters for each unit being constrained:

(1) Quantities of each class II and class VII TAM items that appear in the unit's T/E

(2) Cube of each item (if the item is cube loaded)

(3) Square of each item (if the item is square loaded)

(4) Item square stowage indicator (for each item)

(5) Square constraint

(6) Cube constraint.

In addition, item criticality to the unit is utilized; however, this factor is computed within the model.

The T/E quantities, square, cube, and square stowage indicator for a given Marine Corps unit can be retrieved from the MAGTF data base. Output from the Constrained Cargo Factoring Model (CCF) provides the cube and square constraints.

C. Computation of the Constrained T/E

The logic of the algorithm is given in the flowchart of the CONTEAM model. A description of the model follows.

1. First Step

Read the square and cube constraints for the unit being constrained. Input the T/E quantity, square, cube, and square stowage indicator for each item in the unit. Compute the total cube and square requirement of the unconstrained T/E for the unit.

2. Second Step

Compute a "skeleton" T/E by taking one-half the highest criticality TAM items. Check whether the loading of this "skeleton" T/E will overflow the cube or square constraint placed upon the unit. For some Marine Corps units, it is indeed the case that a relatively modest constraint will make it impossible not only to load the entire T/E, but even to load that part of the T/E consisting of one-half the TAMs of the highest criticality (frequently for the square loaded items). This situation will be flagged. It does indicate the necessity of either: (1) scrubbing the mission, or (2) loading fewer than one-half the authorized T/E quantity of TAM items in the category of highest criticality.

3. Third Step

After the two preliminary steps have been taken, computation of up to 25 tentative loading lists proceeds. The main logic of the CONTEAM model is quite similar to the logic used in Volume II of the SRI/NWRC report "Pre D-Day Fleet Marine Force Materiel and Distribution System (1975-1980)."[1]

Remembering that in the second step a "skeleton" T/E was developed of half the T/E quantity of those TAM items that have the highest criticality, this phase takes the remaining items in the T/E (including the other half of

the highest criticality items) and uses probability tables to compute the quantity of each of the remaining TAMs that are to be loaded to fill, but not to overflow, the constraint. This gives a tentative T/E.

The last phase of the computation is an interpolation and checking of the final results in order to bring the tentative T/E even closer to the constraint.

The output of the program is a constrained T/E, plus a list of quantities of each T/E item that must be left behind under the constraint assumed during the execution of the CONTEAM model.

4. Fourth Step

As emphasized earlier, the computer program produces nothing but a tentative T/E that may need to be adjusted by the operational planning officer. (This is the fourth step.)

The program can be modified mathematically. For example, the factor "half" in the second step can be altered to another factor, such as "five-eighths." However, initial trials show that "half" is a reasonable mathematical assumption for the program. The priority for an item may be changed to either force this item "in" or "out" of the constrained T/E. For instance, if the planner wishes the program to select weapons ahead of every other TAM item, he would assign each weapon a very high priority.

After the planner has made all of the adjustments he deems necessary, he can then rerun the CONTEAM model to obtain a more desirable T/E.

D. Flow Charts of CONTEAM Model

A flow chart illustrating the steps necessary in assigning priorities to items of materiel according to their importance in supporting a unit's

functions was presented in Figure F-2. The CONTEAM model commences with the identical logic. Flow charts picking up the logic of the model where Figure F-2 leaves off follow.

E. General Characteristics of the CONTEAM Model

For TAM items that occur in a unit's T/E with authorized quantities of 1 to 20, the program will include TAMs with the highest criticality and exclude TAMs with the next-to-highest criticality when the constraint amounts to 60-75 percent of the space required to load the unit's full authorized T/E. Of the TAMs with low criticality, the bulky ones will be selectively excluded, but usually in part. That is, the quantity admitted to the constrained T/E will be some fraction of the authorized quantity. Nonpriority TAM items will probably be completely excluded from the constrained T/E.

For items that appear in the unit's T/E with authorized quantities of 40-1200, the program will exclude some portion of the full T/E quantity in almost every case--even for the highest priority items. This is purely a function of the algorithm as it begins to favor the first units of low priority items over, say, the 100th unit of a higher priority item. Experience shows these results to be useful, although they can be modified if the planner feels this is necessary.

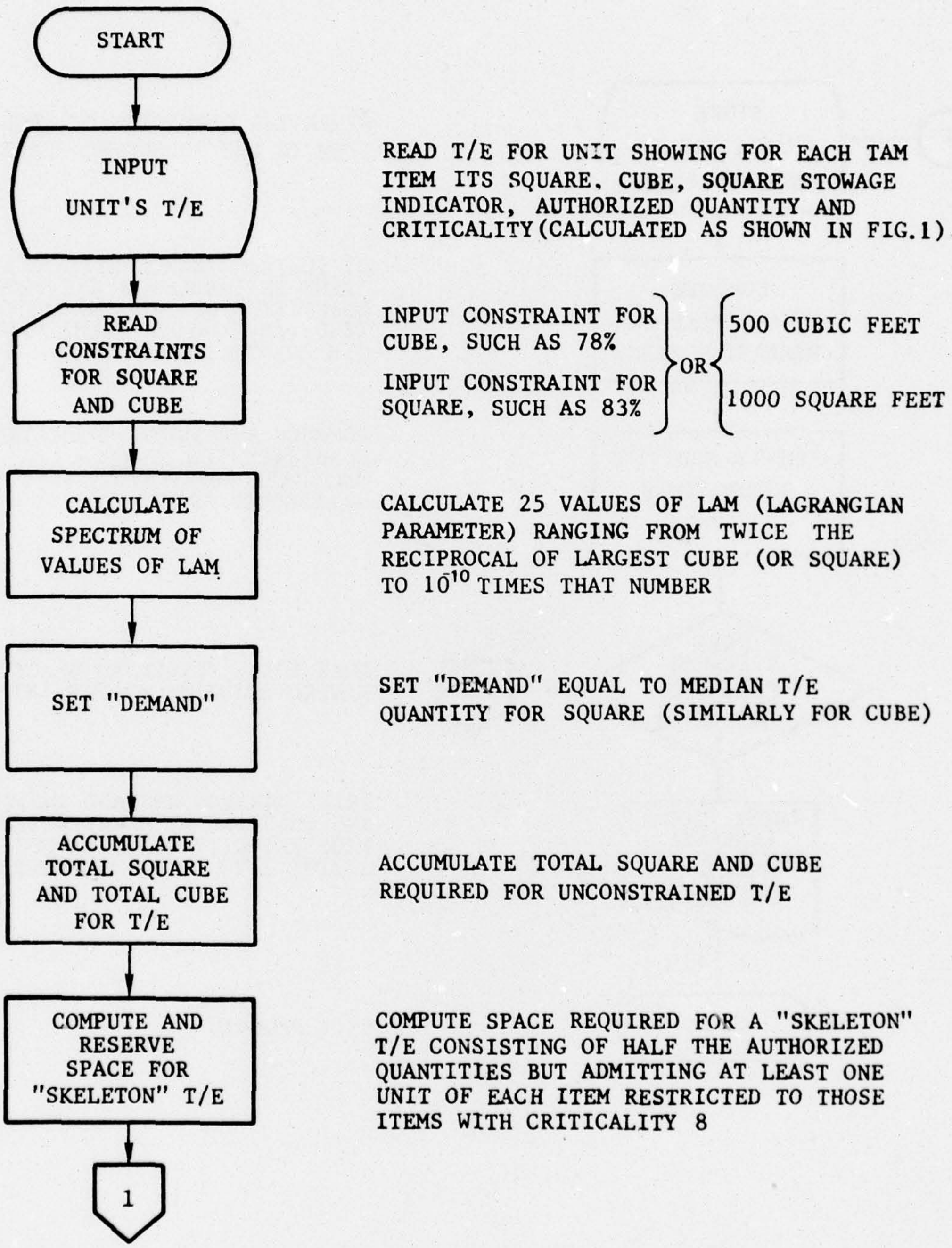
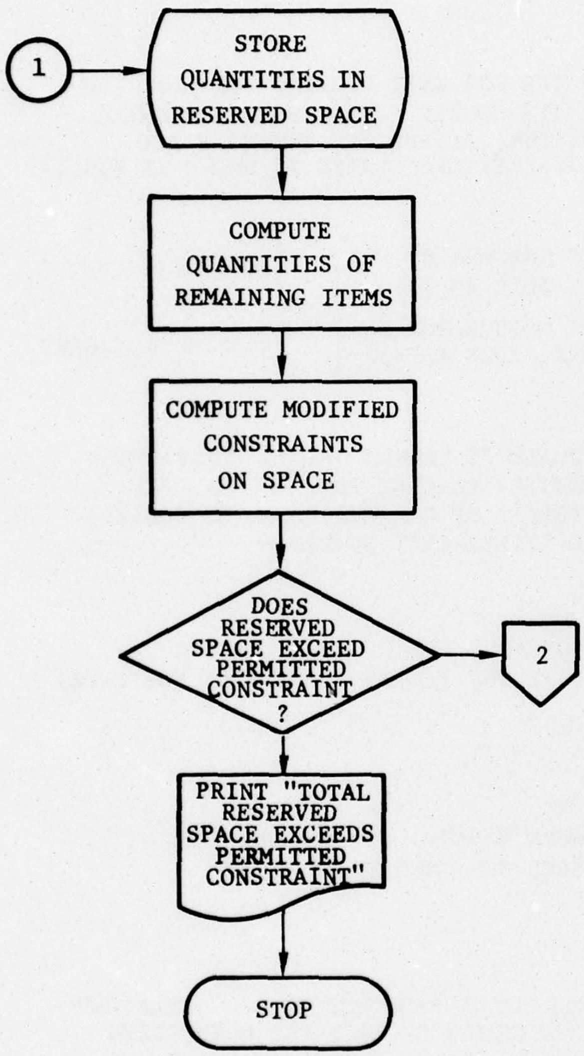


FIGURE F- 2. PROGRAM CONTEAM



STORE THE QUANTITIES OF EACH ITEM IN THE "RESERVED SPACE"

BY SUBTRACTING QUANTITIES OF ITEMS IN 'SKELETON' T/E FROM QUANTITIES OF ITEM IN AUTHORIZED T/E, COMPUTE "REMAINING T/E QUANTITIES"

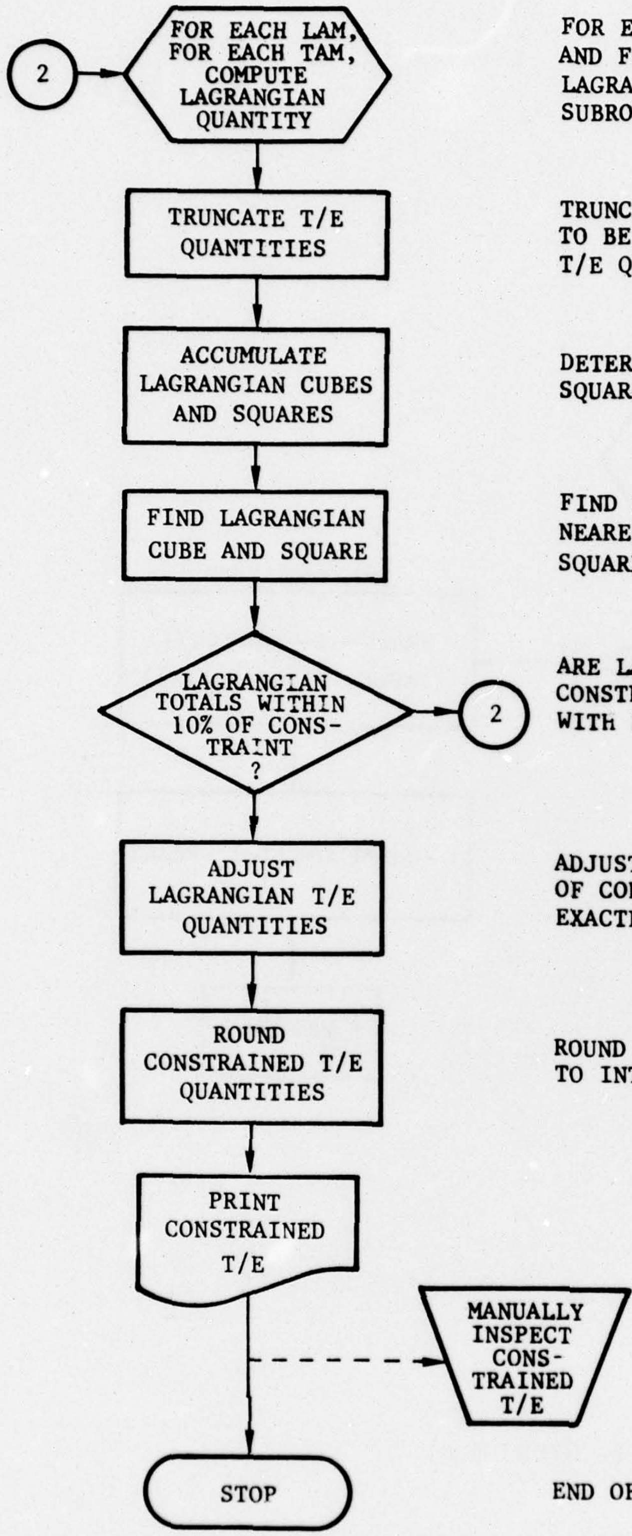
COMPUTE REMAINING "MODIFIED CONSTRAINT" ON SPACE = (ORIGINAL CONSTRAINT) -(RESERVED SPACE)

DOES TOTAL "RESERVED SPACE" EXCEED ORIGINAL CONSTRAINT

PRINT WARNING MESSAGE INDICATING HALF THE AUTHORIZED T/E HIGH PRIORITY ITEMS CANNOT BE LOADED INTO ORIGINAL CONSTRAINT

EXIT PROGRAM

FIGURE F-2. (CONTINUED)



FOR EACH VALUE OF LAM(1, 2..., 25), AND FOR EACH T/E ITEM, COMPUTE THE LAGRANGIAN T/E QUANTITIES FROM SUBROUTINES GETS AND NORB

TRUNCATE T/E QUANTITIES, IF NECESSARY, TO BE LESS THAN OR EQUAL TO "REMAINING T/E QUANTITIES"

DETERMINE TOTAL LAGRANGIAN CUBE AND SQUARE FOR EACH VALUE OF LAM

FIND LAGRANGIAN CUBE AND SQUARE NEAREST TO BUT LESS THAN CUBE AND SQUARE CONSTRAINT

ARE LAGRANGIAN TOTALS WITHIN 10% OF CONSTRAINT? IF NO, CALCULATE ABOVE WITH NEW SPECTRUM OF VALUES OF LAM

ADJUST BY INTERPOLATION LANGRANGIAN OF CONSTRAINED T/E QUANTITIES TO EXACTLY FILL CONSTRAINED SPACE

ROUND CONSTRAINED T/E QUANTITIES TO INTEGER VALUES

MANUALLY INSPECT OUTPUT, IF NECESSARY, RERUN PROGRAM AFTER MAKING ADJUSTMENTS TO INPUT PARAMETERS

END OF PROGRAM CONTEAM

FIGURE F-2. (CONTINUED)

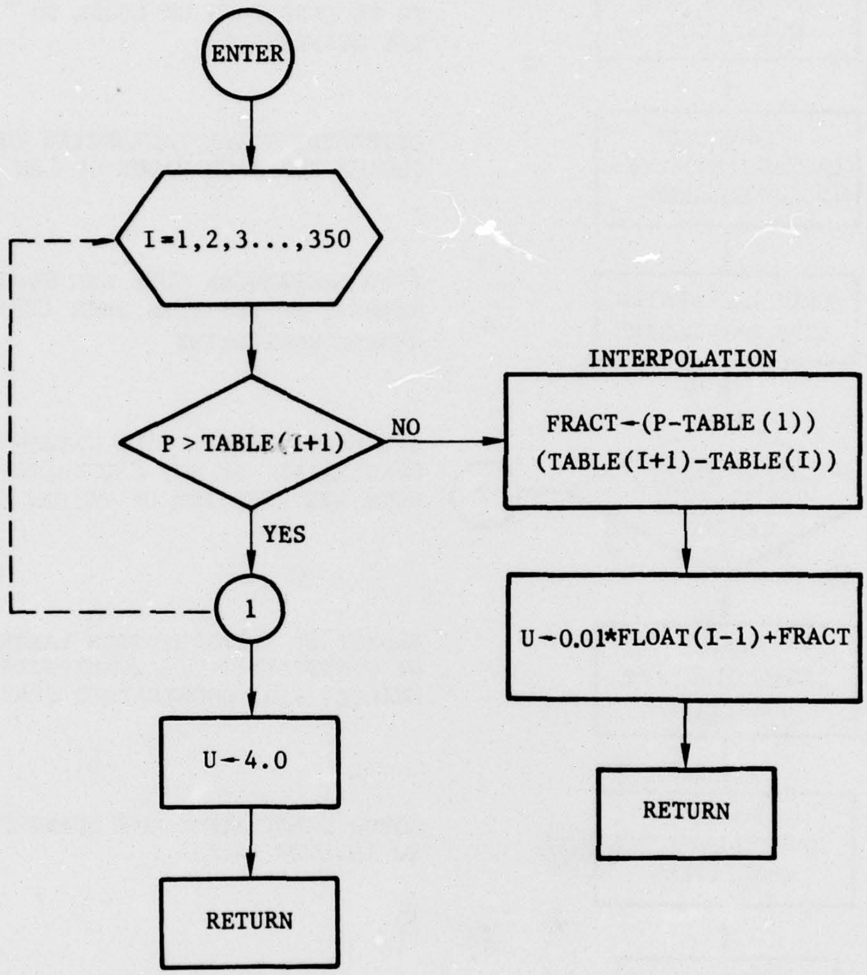


FIGURE F-2. (CONTINUED)

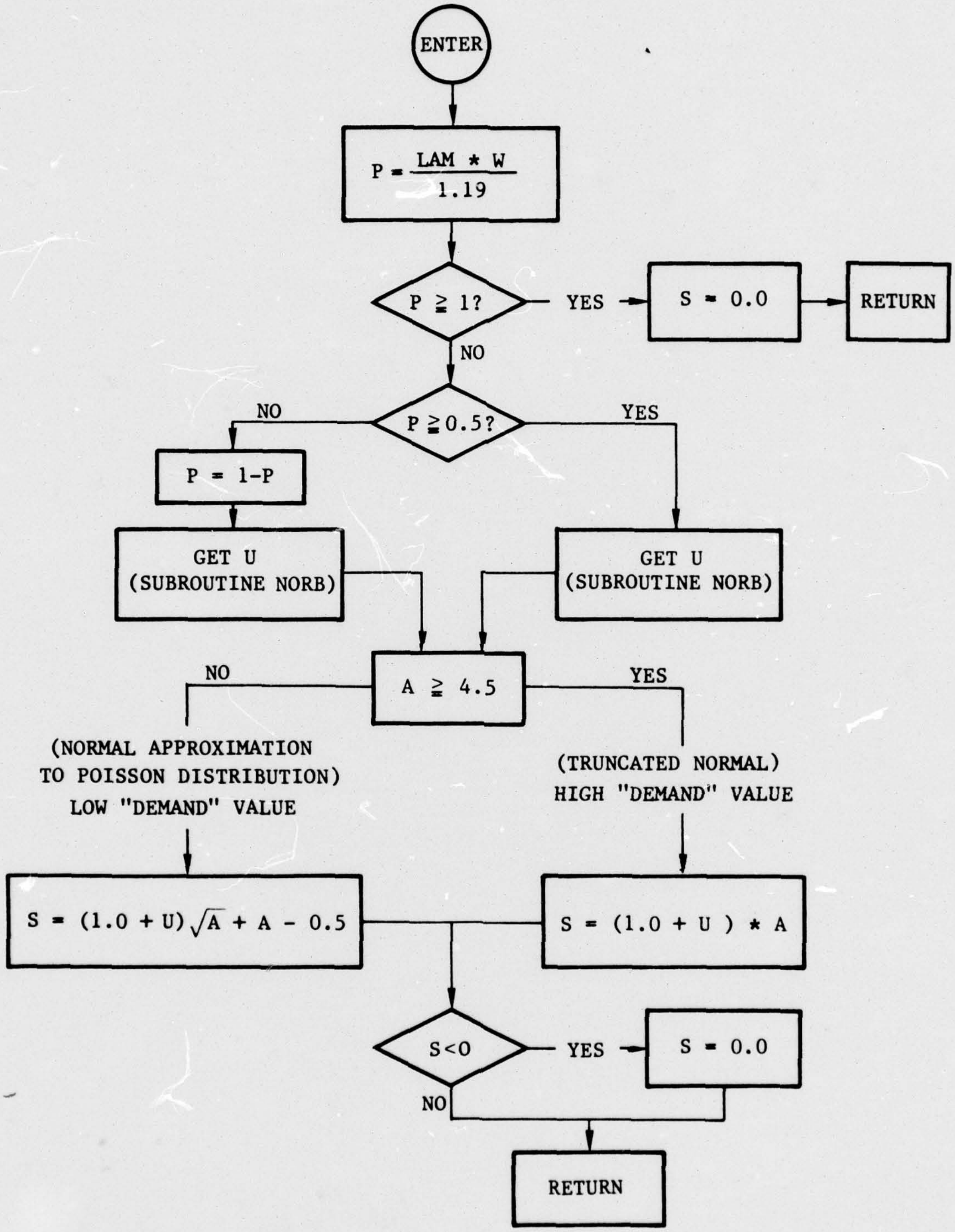


FIGURE F-2. (CONCLUDED)

Appendix F

CONSTRAINED T/E EMBARKATION MODEL

Part 2: Technical Description

Appendix F

CONSTRAINED T/E EMBARKATION MODEL

Part 2: Technical Description

I INTRODUCTION

In the first part of this appendix, an algorithm is described for the construction of a constrained T/E that will maximize protection against shortages. This algorithm was used as a means of obtaining improvement over the conventional method of constructing a T/E (which would simply reduce all authorized quantities in a fixed ratio). In this use, the algorithm is oriented to the construction of T/Es under cube or square constraint.

The general format of the first part of this appendix comprises discussions of the objective of the algorithm, its derivation and mathematical logic, the practical considerations in its application, and finally, a flow description of its operation.

A. Constraints

There are a number of overall constraints that may be used in the algorithm. For the purpose of determining a constrained T/E for distribution of materiel, the respective constraints are square, cube, and (sometimes) total weight. If two constraints operate simultaneously, the algorithm is applied separately to square loaded and bulk cargo. If necessary, bulk space is reassigned, and operational readiness is recomputed with the redistribution of bulk and square space.

B. Objective Function

The objective of the calculation is to determine a T/E, i.e., to show the number of units of each TAM that will minimize the expected pain of shortages and maximize operational readiness.

C. Preliminary Filling

The list of TAMs of highest criticality is assumed to be especially important. To doubly emphasize this importance, a preliminary computation partially fills the constrained space with half the authorized quantities of these high criticality TAMs. If the constraint is so restrictive as to forbid even this part of the T/E, the mission is assumed to be impossible to execute because of lack of shipping space.

II DISTRIBUTION FUNCTIONS OF "DEMAND"

In this algorithm, "demand" is an artificial parameter used to enter (or construct) certain probability tables. Although many records of use have been processed, a useful procedure (for constructing a T/E) based on true demand has not been found. Hence, "demand" is simply a parameter only partly related to T/E quantity. In most cases, the parameter "demand" does not change through an entire T/E. Specifically for square loaded TAMs, "demand" is usually 2; for bulk loaded TAMs, "demand" is usually 5. The algorithm applies to class II and class VII TAMs only; the numbers 2, 5 are chosen since these are medians of the respective authorized T/E quantities.

A. The Assumed Distribution Functions of Demand

For TAMs with a "demand" of less than 4.5, the demand distribution is assumed to be Poisson.[3] For TAMs with a "demand" of 4.5 or more, the demand distribution is assumed to be a truncated normal distribution, with parameter a = 0.78 X the mean demand and standard deviation = 0.47 X the mean demand (= 0.603a), where a is the parameter of a truncated normal distribution, given by:

$$p(t)dt \quad = \quad \frac{1.19}{a\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{t-a}{a}\right)^2\right] dt \ . \qquad (1)$$

Therefore

$$\int_0^\infty p(t)dt = 1 . \qquad (2)$$

Note that, for this choice of parameters in the truncated normal distribution, the standard deviation is a large fraction of the mean. Thus, a very considerable variation about the mean is to be expected.

B. Mathematical Derivation[2]

Calculation of optimum stocking procedure is as follows. Suppose the constraint is:

$$\Sigma\, w_i s_i = W . \qquad (3)$$

Then the quantity to optimize is:

$$F(s_1, s_2, \ldots) = \Sigma\, c_i \int_{s_i}^\infty (t - s_i) p_i(t)dt + \lambda(\Sigma\, w_i s_i - W) . \qquad (4)$$

(All summations are over the values of i.)

The quantities to determine are s_i, the amount of the ith TAM to be supplied. The notation is as follows:

- F = Function to be optimized
- c_i = Criticality
- t = Demand, which is the variable of integration
- λ = Lagrangian parameter needed to take account of the constraint
- w_i = Unit square, or cube, of the ith TAM
- W = Constraint = total square or cube permitted
- $p_i(t)$ = Distribution function of demand for the ith TAM.

Differentiating the function with respect to each independent decision variable, the relation

$$\lambda = \frac{c_i}{w_i} \int_{s_i}^{\infty} p_i(t)\,dt \tag{5}$$

is obtained.

Thus, if the quantity $w_i\lambda/c_i$ is equal to or greater than 1, s_i must be taken to be 0: the ith TAM is not included. If the quantity $w_i\lambda/c_i$ is less than 1, s_i is determined by the equation:

$$\lambda w_i/c_i = \int_{s_i}^{\infty} p_i(t)\,dt\ . \tag{6}$$

It is seen that the greater the criticality c_i, the larger will be the stock s_i. Also, the smaller the unit (square or cube) w_i, the larger will be the stock s_i. On the other hand, when the unit (square or cube) is quite large, the strategy will be to accept shortages in the items that have a large size to gain the extra benefit of avoiding shortages in other items.

The T/E quantity s_i is always truncated so as not to exceed the authorized T/E quantity.

C. <u>Practical Implementation</u>

In all this calculation, the quantity λ is not yet determined. The way to determine λ is by trial. A fixed value is chosen for λ, and the entire supply table, including the value of s_i for each TAM, is computed. Then the total square or cube is cumulated to see whether the trial value of λ is too small or too large. If the trial total is too large, the trial value of λ was too small, and vice versa.

D. Starting the Algorithm

To avoid too many trials, it is desirable to have a reasonable starting value for λ. If the largest unit (square or cube) is 500, a reasonable starting value for λ is 0.002. For a T/E that contains many items with unit square exceeding 500, but very few with unit squares exceeding 5,000, a reasonable starting value for λ is 0.0002. In general, the choice is the reciprocal of the truncating unit square.

In experimental calculations, instead of using a single starting value for λ, and then adjusting, 25 values for λ were used that were expected to bracket the correct budget. The relation between the constraint and the corresponding value of λ is approximately of the form:

$$\lambda^n \, . \, B = \text{constant}, \tag{7}$$

where B is the constraint, and the constant depends on the spectrum of TAMs for which the T/E is being computed. Once a T/E has been computed for each of the 25 values of γ bracketing the constraint, a table showing constraint versus γ can be entered, and the correct number of units of each can be determined by making a final adjustment to the particular T/E that is closest to, but below the constraint. This adjustment is ignored for any TAM already taken in authorized quantity. Any method of adjustment will do; an increase in constant ratio is to be recommended. The ratio is determined by simply summing the square of the short fall TAMs, and comparing this short fall with the constrained space not yet filled. But no TAM must be taken in more than the authorized T/E quantity.

At this point, the quantities for many TAMs will be fractions. For practical implementation, these quantities can be rounded to the nearest whole number.

E. Solution of Equation (6)

It remains to explain how to solve equation (6) for s_i, when all the other letters and the distribution function are known. The method used when the distribution was assumed to be normal (demand, per period, 4.5 units or more) was simply to enter a machine stored table of the normal cumulative probability, and take out s_i. This cannot accurately be done for values of s_i exceeding three times the mean demand, unless the table is considerably more detailed than it is convenient to store in a computer with limited memory space. In this case $s_i = 4.0$ was taken whenever the cumulative probability calculated from (6) exceeded 0.9998 (residual probability less than 0.0002). This means that a T/E quantity exceeding 4 cannot be attained. That is, quantities of a TAM in excess of 4 times the "demand" will always be short.

But some TAMs have very large authorized quantities, and quantity should not be restricted to 20. Therefore, for a TAM with an authorized quantity of 40 or greater, the parameter "demand" is set to 1/8 of the authorized quantity. This device will make it possible to take the entire authorized quantity of a high criticality TAM.

III APPROXIMATION TO EXACT ALGORITHM

A. Assignment Priority List

In this section, a mathematically exact algorithm is described. Later a computer oriented approximation is given, and it is shown that that approximation is equivalent to the exact algorithm. The mathematically exact algorithm begins with the construction of an assignment priority list.

1. Rationale

For each (ordinal) unit of each TAM, the value of that extra unit providing additional protection against shortage must be computed. If $p(t)$ is the probability density of demand for t units, the incremental value of the k-th unit can be shown (see below) to be approximately equal to:

$$(c/w) \int_{k-\frac{1}{2}}^{\infty} p(t)dt \ .$$

Note that the integral runs from $k - \frac{1}{2}$ to ∞.

Notation:

c = Criticality of the TAM

w = Unit square (for square loaded TAMs) or unit cube (for bulk loaded TAMs)

$p(t)$ = Probability density of demand.

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For large values of "demands", $\bar{x}$, it is usual to take:

$$p(t) = \frac{1.19}{a\sqrt{2\pi}} \exp\left[-\frac{1}{2}(t-a)^2/a^2\right], \tag{8}$$

where

$a = 0.78\bar{x}$

$\bar{x}$ = "Demand".

Formula (8) is the density of a truncated normal distribution, truncated at $t = 0$; the mean of the original (nontruncated) normal distribution is equal to its standard deviation a. (See Fig. F-3.)

For low values of "demand," the (discrete) Poisson distribution is appropriate: $p(t) = e^{-a}a^t/t!$, where now a = "demand."

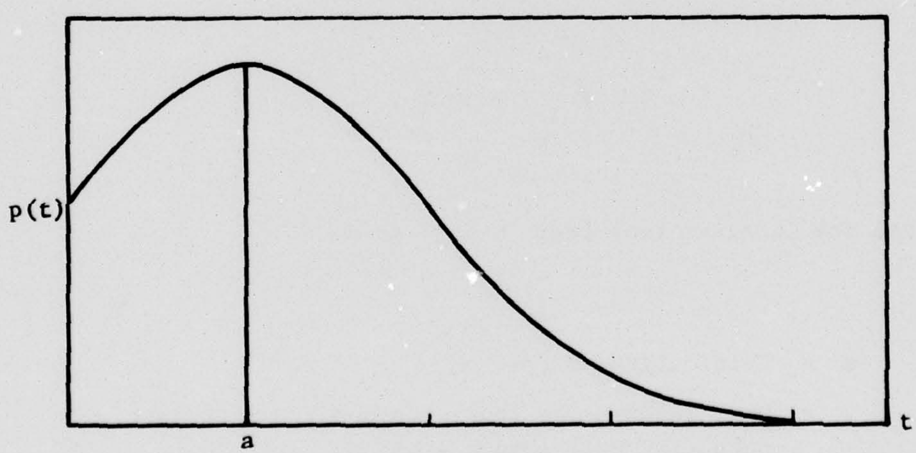

FIGURE F-3. THE TRUNCATED NORMAL DISTRIBUTION, TRUNCATED AT $t = 0$, $a = 0.78\bar{x}$, $\sigma = 0.47\bar{x}$

2. Mathematical Derivation

The extra protection afforded by the next unit of a TAM can be found from tables that are readily available. The precise meaning of the term "extra protection" has first to be specified. In the analysis of this appendix, stress on a military unit, is measured by "number of units needed but not available." Thus, a shortage of 8 is more stressful than a shortage of 2. An authorized T/E for quantity 100 that is 99 percent filled (with 1 short) is less burdensome, in terms of expediting, lost time, and reduced efficiency of operation than is an order for the same quantity (100) that is only 50 percent filled.

If the probability density of "demand" is $p(t)$, and the quantity shipped is k, then the criticality weighted <u>expected</u> <u>shortage</u> <u>penalty</u> is given by the formula:

$$(c/w) \int_k^\infty (t - k)\, p(t)dt \quad .$$

If the probability density corresponds to a discrete probability, the integral sign must be replaced by a summation sign. Assume for the moment that the probability density is continuous; this assumption is valid when the "demand" is large (more than 4.5). As an example, compute the added protection (diminished penalty) provided when 1 unit (instead of 0 units) of a TAM is shipped. The criticality weighted expected shortage penalty will be reduced from:

$$(c/w) \int_0^\infty t\, p(t)dt \qquad \text{to} \qquad (c/w) \int_1^\infty (t - 1)\, p(t)dt \quad ,$$

as the above discussion shows. The first integral $\int_0^\infty$ can be written

as $\int_0^1 + \int_1^\infty$, so the difference in question amounts to:

$$(c/w) \int_0^1 t\ p(t)dt \quad + \quad (c/w) \int_1^\infty p(t)dt \ .$$

The "theorem of the mean" in integral calculus shows that the first integral can be approximated by the expression:

$$\xi_1 \int_0^1 p(t)dt,$$

where ξ_1 is some number between 0 and 1. A better approximation, valid for any slowly changing probability density function p(t), is:

$$\int_0^1 t\ p(t)dt \approx \int_{\frac{1}{2}}^1 p(t)dt \ .$$

The validity of this approximation is obvious in case p(t) is constant in the interval (0,1). In summary then, the diminution of penalty provided by the first unit of a TAM is given approximately by the formula:

$$(c/w) \int_{0.5}^\infty p(t)dt \ .$$

This number can be found by reference to tables of cumulative probability that correspond to the probability density p(t).

Similarly, the further diminution of penalty provided by a second piece of the same TAM is given by the formula:

$$(c/w) \int_{1.5}^{\infty} p(t)dt \quad ,$$

which is an approximation to the difference

$$(c/w) \int_{1}^{\infty} (t - 1)\ p(t)dt \ - \ (c/w) \int_{2}^{\infty} (t - 2)\ p(t)dt \quad .$$

In general, the additional diminution of penalty brought about by the k-th unit of a TAM is given approximately by the formula:

$$(c/w) \int_{k - \frac{1}{2}}^{\infty} p(t)dt \quad .$$

This formula is valid if $p(t)$ changes only slowly in the interval $[k - 1, k]$. The above formulas are certainly valid for the truncated normal distribution, provided the "demand" is large.

3. <u>TAMs With Low Demand (Square Loaded T/E List)</u>

For the square loaded portion of the T/E list, "demand" is typically 2. For this case, a useful probability distribution is the Poisson distribution. This is a discrete distribution so integrals cannot be used to represent the expected number of units short. For a discrete distribution, the correct formula involves a sum, not an integral. The criticality weighted expected penalty for shortage is:

$$(c/w) \sum_{t=k}^{\infty} (t - k)\, p(t) ,$$

provided the current quantity is k units.

The analysis in this case parallels the analysis above for a continuous probability density. The work with sums is simpler than the work with integrals. The result is that the quantum diminution in penalty provided by the k-th increase of the TAM quantity is:

$$(c/w) \sum_{t=k}^{\infty} p(t) .$$

For the Poisson distribution corresponding to "demand" a, this is clearly equal to:

$$(c/w) \sum_{t=k}^{\infty} \frac{a^t e^{-a}}{t!} .$$

Tables of this partial sum are available for a large range of values of a "demand." Also, the partial sum can be approximated by use of other tables, only tables of the normal probability integral are needed (see the discussion following equation (9)).

4. Construction of the Working List

After completing the "incremental protection" computations, the next step is to list all (ordinal) units of all TAMs in sequence. The sorting is arranged so that the unit providing the greatest quantum of benefit comes first, followed by the unit that provides the second greatest benefit. A section of such a list looks as shown in Table F-5. The most advantageous T/E for any total is the one obtained by simply

chopping Table F-5 off at the row indicated by the figure in the last column of the table. This result is exact; however, there is a disadvantage in using this method.

B. <u>Disadvantages of the Above Algorithm</u>

If TAMs are added to or removed from a T/E, the entire list (Table F-5) must be resorted. Another difficulty comes from the fact that the incremental values must be computed for a very large number of units of each TAM; thus, the number of entries (TAM No.--Unit No.) to be sorted can be 2,500 or more, even for a modest T/E of only 50 TAMs.

Table F-5

SEQUENCE OF TAMs SORTED ACCORDING
TO THE BENEFIT PROVIDED BY EACH UNIT--CONSTRAINT = 45

TAM	Ordinal Number of Unit	Unit Square	Cumulative Square
A0...	1st	3	3
A0...	2nd	3	6
C2...	1st	2	8
A0...	3rd	3	11
C3...	1st	5	16
C2...	2nd	2	18
A0...	4th	3	21
D4...	1st	20	41
E....	1st	1	42
A0...	5th	3	45

NOTE: Constraint filled (if T/E quantity of A0... is 5 or more)

Table F-6

VALUES OF THE NORMAL PROBABILITY INTEGRAL, P(u),
FOR VALUES OF u BETWEEN 0.0 AND 3.49

$$P(u) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{u} \exp\left[-\frac{1}{2} t^2\right] dt = 1 - Q(u)$$

$$Q(u) = \frac{1}{\sqrt{2\pi}} \int_{u}^{\infty} \exp\left[-\frac{1}{2} t^2\right] dt$$

u	+ .00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

Source: Handbook of Mathematical Functions, U. S. National Bureau of Standards, AMS#55, Table 26.1, 1968.

C. An Alternative Computation

The alternative computation is explained in the flow description following.

1. Computation

For each value of LAM, and for each TAM, the T/E quantity (for constrained square or cube) is computed according to the formula:

$$(w)(LAM)/c = \int_{s}^{\infty} p(t)dt \quad , \tag{9}$$

where

w = Unit square or cube (if total is the constraint)

c = Criticality factor

LAM = Value taken unchanged during this step of the algorithm

p(t) = Frequency function for the particular TAM under consideration

s = Number of units: this is the unknown in the equation.

If (w)(LAM)/c exceeds 1, or is equal to 1, s is taken as 0.

The formula (ℓ = 1.19)

$$p(t) = \frac{\ell}{a\sqrt{2\pi}} \exp\left[-\frac{1}{2}(t - a)^2/a^2\right] \tag{10}$$

has been previously stated. Therefore, (9) can be solved for s by solving the equation

$$\frac{(w)(LAM)}{(c)\ (\ell)} = \frac{1}{\sqrt{2\pi}} \int_u^\infty \exp\left(-\frac{1}{2} v^2\right) dv \qquad (11)$$

for u, and then setting s = ua + a. The integral on the right-hand side of (11) will be recognized as the standard probability integral; moreover, the integral is independent of the TAM, and so may be entered into a computer in tabular form. This makes it possible to obtain the value of u by table look-up. In the program the table was to have only finite length, so the arbitrary decision was made that whenever the quantity $1 - \frac{(w)(LAM)}{(c)\ (\ell)}$ exceeded 0.9998, u would be entered as 4. The values to be entered are given in Table F-6, which is adapted from standard publications.

For square loaded TAMs, "demand" was taken = a = 2; then the use of equation (4) is not an accurate method. The formula for p(t) should be replaced, for such TAMs, by the Poisson distribution. An approximation to the Poisson distribution frequency function, given by the following lemma, was used:

If t is Poisson distributed, with mean a, then

$\frac{t - a + 0.5}{\sqrt{a}}$ is approximately normally distributed.

For values of a near 0, and for values of t equal to 0 or 1, the word "approximately" should be read as "very approximately"; nevertheless, for the present purpose, the approximation is adequate. The only features of the distribution required to be approximated are the cumulative values, i.e., the frequency function integral or distribution function. For these values, the approximation is acceptable. The fact that the normal distribution function is again involved makes the table look-up convenient; the value of u is computed as before, and s is taken to be:

$$s = u\sqrt{a} + a - 0.5 \quad . \tag{12}$$

It is understood that s must never be negative; when (12) brings out a negative result, it must be adjusted upward to 0. (The result could be very slightly negative in certain cases.)

All quantities s must be truncated to the authorized T/E quantity if they exceed it.

As the calculation proceeds from one TAM to the next, cumulative totals are kept in a running fashion for each of the values of LAM. At the end of this phase of the calculation--that is, when all TAMs have been scanned--there will be a set of 25 total constraints, one for each of the 25 values of LAM. The item record of each TAM will show the number of units of that TAM needed to bring out the total constraint shown. In general, the number of units shown will be a fraction. In other words, it is assumed in this preliminary calculation that each TAM is divisible. This device is a conventient fiction to make it possible, in the next step, to interpolate more accurately from one constraint to the next. If by chance the correct constraint is not bracketed in the 25 calculations, further choices of LAM are to be made. A quick procedure for homing in on the best choices for LAM is given next.

2. Interpolation to Obtain the Correct Value of LAM

The fourth step describes the inverse interpolation needed to home in on the correct value of LAM, and also the final interpolation used to obtain the T/E. In the preceding pages it was shown how to compute a constrained square or cube for any given value of LAM.

A graph of the relationship between LAM and constrained cube has approximately the shape indicated in Figure F-4.

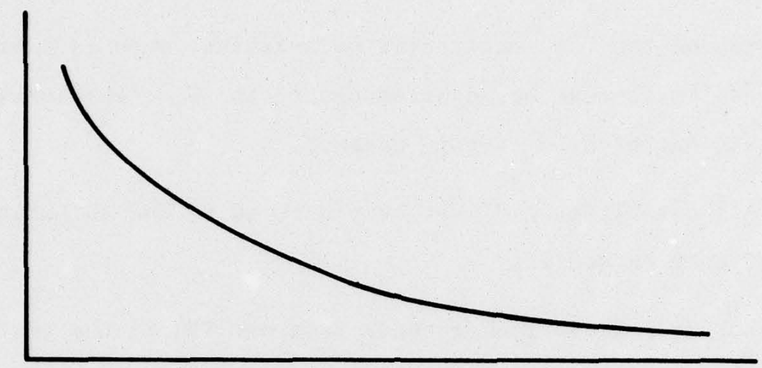

FIGURE F-4. APPROXIMATE FORM OF RELATION BETWEEN LAM AND CUBE

- When LAM is decreased, the corresponding cube will increase
- If LAM is taken small enough, the cube can equal the authorized T/E cube
- For large values of LAM, the cube approaches zero. (Ultimately, it can be zero.) In other words, above a threshold value, there is no computation to be done.

If the 25 trial values of LAM run from the reciprocal of the smallest item cube to 10^{-10} times this quantity, the constraint will be well approximated by one of the 25 trial grand total cubes. (If by chance (or error) this does not occur, interpolation or extrapolation should be used; a graphical procedure, or logarithmic interpolation, is quite accurate. To make a final adjustment from an approximate constrained cube to the exact constraint the method explained in the computation flow description was used. Briefly, this is a proportional increase in the trial T/E quantities of all TAMs at below authorized quantities in the tentative T/E.

APPENDIX F REFERENCES

1. J. L. Brenner, W. S. Duff, and R. B. Ringo; "Pre-D-Day Fleet Marine Force Materiel Requirements Determination and Distribution System (1975-1980--Volumn II: Algorithms for the Construction of a Table of Supply Under Size Constraints and for the Simulation of Item Processing at a Marine Corps Supply Center"; Final Report, Stanford Research Institute Project EGU-1003-50-53, Contract N00014-71-C-0205; October 1971.

2. M. A. Geisler and H. W. Karr; "The Design of Military Supply Tables for Spare Parts"; Operations Research Society of America Journal, Vol. 4; (pp. 431-442) 1956.

3. E. C. Molina; "Poisson's Exponential Limit"; Van Nostrand, New York.

Appendix G

MAGTF IMPROVEMENT EFFORT

Appendix G

MAGTF IMPROVEMENT EFFORT

I BACKGROUND OF MAGTF IMPROVEMENT EFFORT

Because the "Materiel Weight and Cube Control" study required many long computer runs of the program MAGTF, and because of the excessive processing time on the computer each of these runs would require, the first task of this project was to streamline the coding of MAGTF for more efficient processing. An associated task in this effort was to correct all known programming errors. Also, an up-to-date and accurate data base was to be provided the project. These reprogramming, debugging, and data base updating efforts had to be provided within the limitations of a restricted time frame and budget.

A. Determination of Where to Concentrate the Program MAGTF Improvement Effort

Before the process of speeding up the execution time of program MAGTF could commence, it was necessary to determine exactly where in the MAGTF coding the majority of the total execution time of a run was being spent. To accomplish this task, temporary FORTRAN statements were inserted into each of MAGTF's original 192 subroutines to measure the amount of CPU time required by each of the individual subroutines. Then, by running a small, test MAGTF, it was possible to determine precisely the percentage of the total execution time of the program that was being consumed by each of the subroutines.

Additional coding was also inserted into each subroutine to count the total number of times each of the subroutines in MAGTF was called or accessed during the execution of the test case.

This preliminary analysis enabled the project team to concentrate its efforts on reducing the execution time of only those subroutines that would give the maximum payoff (reduced CPU time) for the minimum man-hours expended by the team.

B. Program MAGTF Core Reduction

Equally important as the reduction of the running time of MAGTF subroutines was the reduction of the overall core requirement of the program. The reduction of the program size was important since the original size of the program was so large that it could not be loaded in its entirety into a 200K partition on the HQMC's 360/65 computer. Because of the program MAGTF's length it was, therefore, necessary to break the program up into several overlays. By overlaying, the amount of coding that was required to reside in core at any one time was greatly reduced; however, the execution time of the program was greatly increased since each time a new overlay was needed by MAGTF, the overlay currently residing in core had to be written to disk storage, and the new overlay then read from disk storage. This additional reading and writing (I/O) placed an additional burden on top of the already lengthy running time of the program. By reducing the total core requirement of program MAGTF, fewer overlays would be required, thereby reducing the I/O requirements of the program, which in turn decreased the overall execution time of the program.

C. Elimination of Debug Statements

During the programming of MAGTF, it was found to be useful to place several debug PRINT statements in each of program MAGTF's subroutines.

These debug PRINT statements could be activated by either the programmer or the user of MAGTF by including a DEBUG card in his data stream. However, as MAGTF became more frequently utilized and reliable, the need for the debug coding became less and less useful. Therefore, all of the debug statements were removed from the production version of program MAGTF. This accomplished a significant reduction in core storage requirements, as well as a noticeable reduction in CPU time required to execute the program.

D. Reduction of I/O Buffers

The next step in improving the execution time of MAGTF was to reduce the size of the I/O buffers for the card reader, the card punch, and the printer. By reducing the size of the I/O buffers, a considerable amount of core storage was saved at the expense of a very slight increase in CPU and I/O time.

E. Program MAGTF Coding Improvements

The biggest saving in CPU time resulted from the recoding of three subroutines and by the addition of a new subroutine. Subroutines SYSTEM, BINARY, and CHTONO were almost completely recoded in a vastly more efficient manner. A completely new subroutine, GETCHR, was written to handle more expeditiously special character transfers previously handled by subroutine CHAR.

F. Streamlining of PRINT Routines

In programming the original version of the program MAGTF, a separate subroutine was written to perform the printing of each unique page of output. Since it was frequently the case that the output from a regular listing differed from that of a compendium by only the heading or by the inclusion or omission of a column of figures, it was decided to combine

these similar PRINT routines into a single subroutine whenever possible, and to set a switch in the new routine that would allow the subroutine to decide which heading or which column of figures to print. This effort resulted in a very substantial core reduction.

II ADVANTAGES OF CORE REDUCTION

The results of the core reduction effort were utilized in two ways.

A. Elimination of Overlays

The first utilization of the additional core now available from the reduction effort was to completely eliminate all overlays i.e., allow the complete program to reside in central memory during the execution of the program as opposed to the original time-consuming calling of the overlays to and from disk storage. Running with the unoverlayed version of MAGTF allowed a large savings in I/O time.

B. Increasing Accumulation Blocks

The second way in which the freed core was utilized was to retain the most frequently needed accumulation blocks in central memory permanently, as well as to increase the number of accumulation blocks temporarily residing in core from 4 to 32. This improvement by itself reduced program MAGTF's total I/O requirement approximately 60 percent.

III MAGTF MAINTENANCE

Several program MAGTF errors were identified and corrected during the improvement effort. The majority of the corrections were for overflowed fields, misspelled headings, column and total alignment, etc. All of these can be grouped under the general description of formating problems. These problems were as a rule quickly and easily corrected.

The most troublesome error to correct was in the restart procedure of MAGTF. As it turned out, the problem was not so much a programming deficiency as it was an interface problem with the operating system. Whenever in the execution of MAGTF an abnormal ending, such as an "operator drop" or a "time limit" halt was experienced, the disposal of the output buffers was inconsistent. In MAGTF's case, the printed output listing would indicate that the input data had been processed to a given point, while the output tape (restart tape) would indicate the processing terminated at an entirely different point. Therefore, when an attempt was made to restart a run that had terminated abnormally by telling the program to proceed from where the output listing left off, the program became confused since this was not the same place the restart tape left off. This problem was corrected by reprogramming the restart procedure with a more complicated logic.

The second troublesome bug to correct was in the "mobile loading" procedure. In this case, correction of the programming errors was not the problem so much as the correction of each error seemed to uncover a new error. Such a sequence continued through several iterations until the mobile loading procedure finally performed as desired.

IV RESULTS OF THE MAGTF IMPROVEMENT EFFORT

The results of the MAGTF improvement effort were startling. All known program and data base errors were cleaned up, and the program's improved execution time exceeded all expectations.

Personnel from the Assistant Chief of Staff (Installations and Logistics, LPS) and the MAGTF systems coordinators processed a Marine Amphibious Force (MAF) computer run during January 1975. The computer processing time for this run was approximately 63 wall clock hours, or 29.11 minutes per unit on the HQMC computer. In early November 1975, a Marine Amphibious Brigade (MAB) was processed using the improved version of program MAGTF averaging 4.12 minutes per unit--an 86 percent improvement over the original 29.11 minutes per unit.

As can be seen from Table G-1, I/O time has been decreased from 22.99 minutes per unit to 1.76 minutes per unit, or a 92 percent reduction. CPU time has been reduced from 6.12 minutes per unit to 2.36 minutes per unit, a 61 percent reduction.

Table G-1

COMPARISON BETWEEN ORIGINAL VERSION OF MAGTF AND IMPROVED VERSION OF MAGTF EXECUTION TIMES FOR PROCESSING MARINE CORPS T/O UNITS

	Original MAGTF	Improved MAGTF	Improvement	Percentage Improvement
I/O minutes per unit	22.99	1.76	21.23	92%
CPU minutes per unit	6.12	2.36	3.76	61
Total minutes per unit	29.11	4.12	24.99	86%

V FUTURE PROGRAM MAGTF IMPROVEMENT

During the process of improving the execution time of program MAGTF, several areas were observed where the program could be even further improved. These areas for possible improvement include ease of user usage, increased readability of printouts, and programming improvements to decrease execution time. It is felt that the computer running time of program MAGTF can be further reduced by a minimum of 50 percent with additional reprogramming.

In light of the above, the following recommendations are made:

(1) Reprogram the method by which MAGTF accesses the data base. By making a second pass through the UNIT and SYSTEM files during a program CREATE run, it is possible to attach disk addresses to each trailer record, and thus enable MAGTF to directly address any data record. This effort will eliminate two binary searches (decreasing CPU time) and eliminate one disk access for every retrieval (decreasing I/O time).

(2) Modify the data base structure so that as many data elements as possible lie on computer word boundaries. This will save additional computation time since these elements can be read into core without the need of repositioning these elements before calculations can be made.

(3) Store data in the data base in a computational (Integer or Floating Point) format. This will eliminate the necessity of decoding an element when it is retrieved before it can be used for computations.

(4) Each subroutine in program MAGTF should be examined individually for further code condensing and execution time improvements.

(5) The restart procedure should be reprogrammed to eliminate the need for user intervention.

(6) The MAGTF Program should be modified to permit all intermediate maintenance ground support equipment, computed from supported aircraft, to be displayed in the Headquarters and Maintenance Squadron listing.

(7) The program should be modified to search through the entire user input stream for errors before processing a MAGTF run.

(8) Output formats should be reformatted where necessary to eliminate ambiguities and to facilitate reading and comprehension.

Appendix H

HQ FMFPAC DATA ANALYSIS

Appendix H

HQ FMFPAC DATA ANALYSIS

I GENERAL

This appendix contains a more detailed description of the analysis undertaken on the records of requisitions referred to in the HQ FMFPAC report. A summary description of the analysis, with some tabulations, is in the main body of this report.

The data to be processed consisted of several tape files that recorded some 900,000 requisitions originating in Vietnam during 1968-1970. Accompanying written material was used in decoding and interpreting these files. The files were originally prepared to obtain dollar funding requirements for the Vietnam operation. Records showed not only unit prices, but also quantities, dates, requisitioning organization, and combat status (active/na). This voluminous file warranted the expenditure of some modest analysis.

It was too much to expect that most TAMs in every current T/E would appear in the HQ FMFPAC file itself. Many descriptive TAM (end item) numbers have changed in the last few years; T/Es have changed; some equipment has become obsolete: some new equipment has been added. Even so, the file could be useful if a correlation existed between monthly consumption rate (demand) and a definitely determinable parameter, such as unit price or unit weight. If such a correlation could be validated, then future consumption, <u>averaged over all TAMs in a T/E</u>, could be estimated because both the weight and the T/E quantity of every TAM are entered in the MAGTF data base.

Even though there may be occasional deviations in consumption or demand from the consumption calculated from a correlation formula, the formula is still useful. If the deviations are small on the whole, and if large deviations are rare, the correlation formula can be used to compute a tentative T/E for an amphibious operation that must proceed under shipping constraint.

Experience with other supply systems suggests that a correlation between demand and unit weight exists of the form:

$$D = a W^{b},$$

where

D = Demand (quantity, units) per month

a = Constant of proportionality

W = Unit weight

b = Dimensions exponent, between -1/3 and -1.

If this correlation is indeed a valid one, ordinary regression analysis can be used with any sufficiently extensive data file to determine the unknown constants a and b. Indeed, the principal unknown is the exponent b. The constant of proportionality a, if one exists, can probably be determined in other ways. Furthermore, for some stocking purposes, the value of a is not needed.

II REDUCTION OF THE DATA

A. Record Extraction

The file contained a record of all (or perhaps of some) requisitions that were made in ordinary fashion. It is known that no emergency requisitions were included in the file. The items requisitioned were identified by FSN (Federal Stock Number). The first step was to extract only those records that pertained to an end item (called a TAM). The extract routine required a specially prepared input file.

This file (file A) showed, for each TAM from A0001 to E9999, the FSN corresponding to the TAM. The flow chart for the extract routine is shown in Figure H-1.

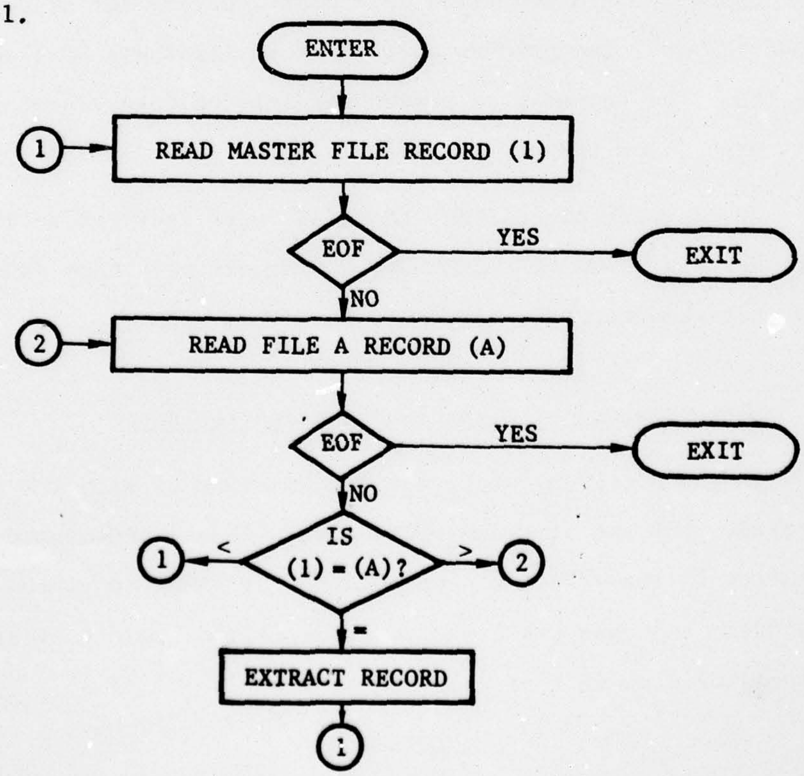

FIGURE H-1 ROUTINE FOR EXTRACTING TAM RECORDS FROM MASTER FILE

AD-A041 598 STANFORD RESEARCH INST MENLO PARK CALIF NAVAL WARFAR--ETC F/G 15/5
MATERIEL WEIGHT AND CUBE CONTROL (1975-1980).(U)
MAR 76 T H ALLEN, R B RINGO N00014-75-C-0708
UNCLASSIFIED NL

7 OF 7
ADA041598


END
DATE
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8 - 77

The primary sort in the master file was actually RUC (Reporting Unit's Code), so that the exit point in the preceding flow chart was, in fact, a subroutine that rewound file A, and progressed to the next RUC in the master file. After all RUC subfiles were processed, the extract routine was ended.

Certain organizationally identical units occurred several times in the master file--for example, HQ company in the 1st, 2nd, 3rd,... battalions. Each requisition record had a date (month 1-24). Combat status for each RUC was available. Thus, it seemed likely that some measure of variation between organizationally identical units in combat status in the same theater of operations might be obtainable.

B. Extraction of Weight, Cube, and Square

Several extracted files were made, chiefly for military units M1038, M1988. The primary sort in these files was RUC; secondary sort was FSN. The record also showed requisition date, requisition quantity, unit price, and TAM.

For further processing, the files were resorted so that the secondary sort was TAM. The weight, cube, and square were then added to each record that corresponded to a class VII (end item) TAM.

C. Determination of Normalized Consumption Rate

In the preceding step, the T/E quantity of each TAM was also entered. The specific consumption rate (consumption rate per unit quantity in the T/E) was next obtained by simple division. This is the datum (D) that was expected to correlate logarithmically with unit weight (or with unit price).

Parenthetically, note that the T/E quantity used to bring out specific demand was the current (1975) authorized T/E quantity. It is common knowledge that most T/E quantities in the Vietnam Theater were expanded. If the expansion was more or less uniform over all TAMs in the T/E the specific demand (D) would be merely magnified uniformly. A correlation of the form $D = a W^b$ would still be expected to exist, but with an altered value of a.

C. Search for Correlation

Reasonable attempts to find a correlation ended in failure. Either the records available were incomplete, or else the postulated correlation does not in fact exist.

Many supply systems do show a correlation of the postulated type. That is, very large or expensive items of equipment are so well made, or are so well protected and so carefully serviced in use, that they tend to last longer than do smaller items of equipment. There does not seem to be a logical, operational explanation for the failure of this postulate. Perhaps the records were incomplete.